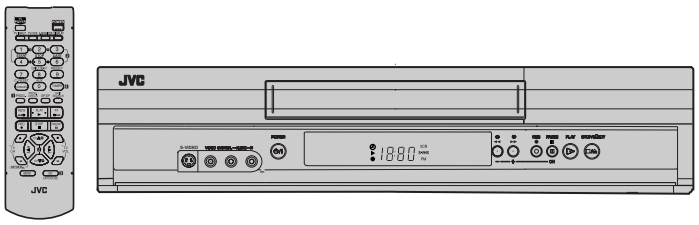
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-S2902Us



S-VHS
Super VHS ET
Hi-Fi

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700(MECHANISM ASSEMBLY).

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-S2902US.)*

GENERAL

Power requirement	: AC 120 V∿, 60 Hz
Power consumption	
Power on	: 16W
Power off	: 1.5 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: –20°C to 60°C (-4°F to 140°F)
Operating position	: Horizontal only
Dimensions (WxHxD)	: 435 mmx94 mmx248 mm (17-3/16"x3-3/4"x 9 -3/4")
Weight	: 2.7kg (5.9lbs)
Format	: S-VHS/VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525lines/ 60 fields
Recording/Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	
VHS	: 230 lines
S-VHS	: 400 lines
Frequency range	
Normal audio	: 70 Hz to 10,000 Hz
Hi-Fi audio	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (INx1, OUTx1) S-video connectors (IN x 1, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2–13
UHF	: Channels 14–69
CATV	: 113Channels
RF output	: Channel3 or 4 (switchable; preset to Channel3 when shipped) 75ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-year programable timer/8programs

Memory backup for timer is not supported.

ACCESSORIES

Provided accessories	: Infrared remote control unit, Lithium battery –CR2032 RF cable (F-type)

Specifications shown are for SP mode unless specified otherwise.
E. & O.E. Design and specifications subject to change without notice.

HR-S2902US V16S0

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape 3) Spacers 5) Barrier
   2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

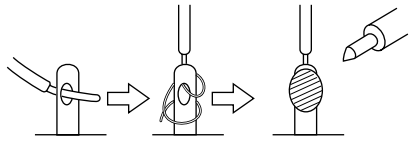


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

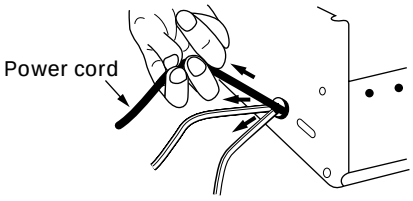


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number :** E03830-001
    2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

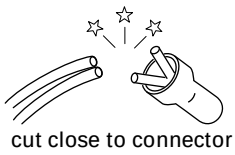


Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

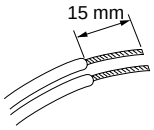


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

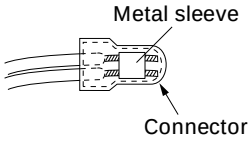


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

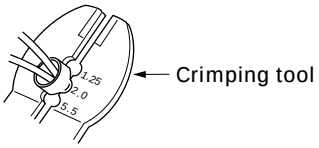


Fig.6

(5) Check the four points noted in Fig.7.

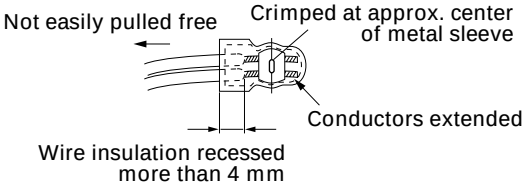

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

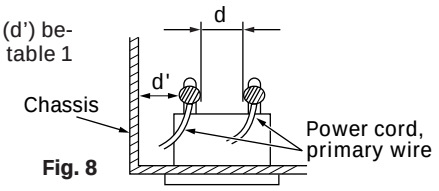


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

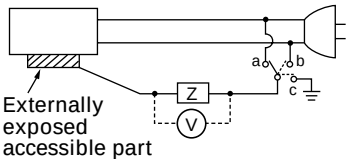


Fig. 9

5. Grounding (Class Ⅰ model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

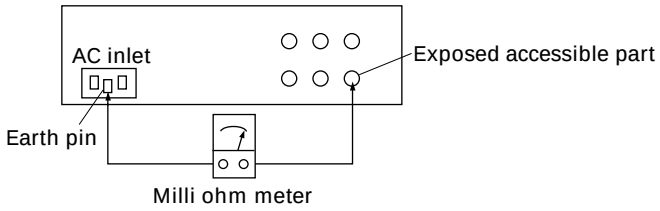


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 µF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
DISASSEMBLY

1.1 Manually removing the cassette tape

If you cannot remove the cassette tape which is loaded because of any electrical or mechanical failures, manually remove it by taking the following steps.

(1) Unplug the power cord plug from the power outlet.
(2) Refer to the disassembly procedure of the VCR and perform the disassembly of the major parts before removing the mechanism assembly. (See Fig. 1-1a.)

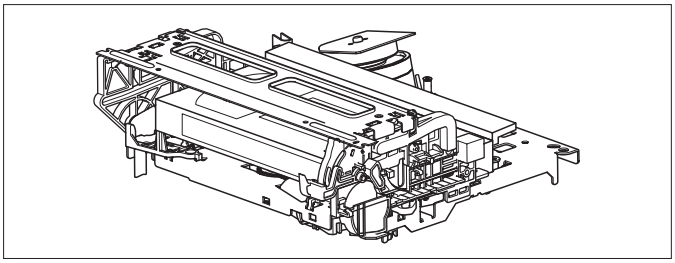


Fig. 1-1a

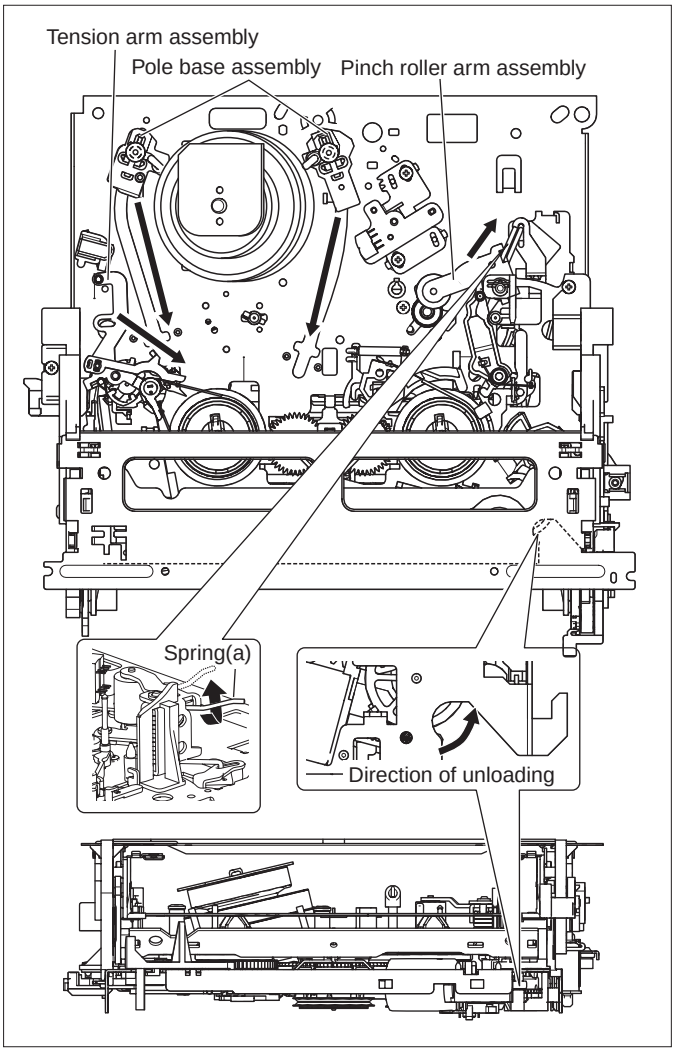


Fig. 1-1b

(3) Unload the pole base assembly by manually turning the gear of the loading motor until the pole base assembly is hidden behind the cassette lid. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig. 1-1b.)
In case of mechanical failures, while keeping the tension arm assembly free from tension, pull out the tape on the pole base assembly. Take the spring(a) of the pinch roller arm assembly off the hook, and detach it from the tape.
(4) Remove the screw (a) of the side frame (L/R).
(5) Hold the slack tape and cassette cover together, lift the cassette tape, top frame, cassette holder and side frames (L, R) together from the rear and remove them by disengaging the hooks (a) and (b).

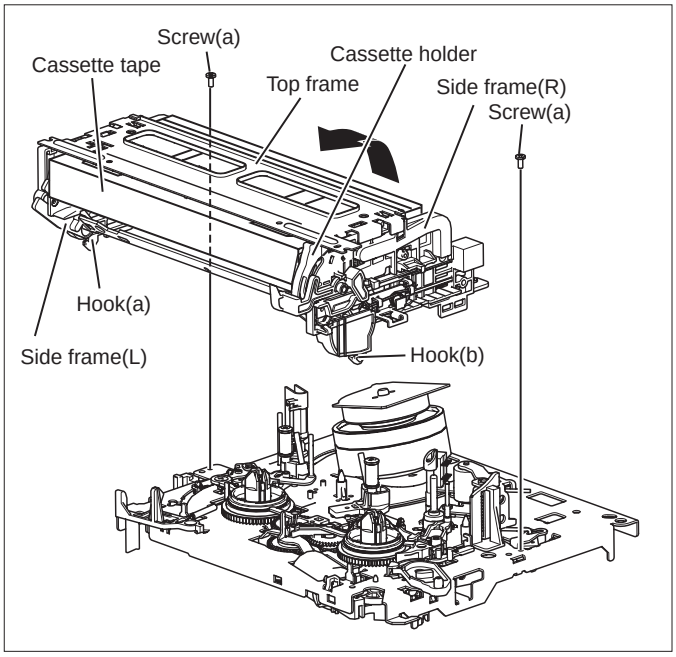


Fig. 1-1c

(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

1.2 Removing the major parts

1.2.1 How to read the procedure table

This table shows the steps for disassembly of the externally furnished parts and board assemblies. Reverse these steps when re-assembling them.

<Example>

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover,	1-3a	4(S1a),(S1b),3(L1a), 2(SD1a),(P1a),(W1a), CN1(WR1a),	<Note 1a>
	Bracket		2(S1c)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order.
These numbers are also used as the identification (location) No. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig. No. showing procedure or part location.
(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P= Spring, W= Washer, S= Screw, L= Locking tab, SD= Solder, CN**(WR**)= Remove the wire (WR**) from the connector (CN**).

Note:

- ***The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.***

(5) Adjustment information for installation

1.2.2 Disassembly procedure

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	1-2-2d	3(S1a), 2(L1a)	
[2]	Front panel assembly	1-2-2d 1-2-2a	2(S2a), 2(L2a), 2(L2b), 3(L2c)	<Note 2a> <Note 2b>
[3]	Mechanism assembly	1-2-2d	CN2001(WR3a), (S3a), (S3b)	<Note 2a> <Note 3a>
	(Drum Shield)		(S3f), (L3a)	<Note 3b>
	(Drum assembly)	1-2-2b 1-2-2c	CN1(WR3b), (S3x), (S3y), (S3z)	<Note 3c>
[4]	Main board assembly	1-2-2d	(L4a), (L4b), (L4c), (L4d)	

<Note 2a>

- Be careful not to damage the connector and wire etc. during connection and disconnection.
- When connecting the flat wire to the connector, be careful with the flat wire direction.

<Note 2b>

- When reattaching the Front panel assembly, make sure that the door opener of the Side frame (R) is lowered in position prior to the reinstallation.
- When reattaching the Front panel assembly, pay careful attention to the switch lever of the Front panel assembly not to make it touch the switch knob of the Main board assembly from the side.
- When reattaching the Front panel assembly, lift the Cassette door slightly.

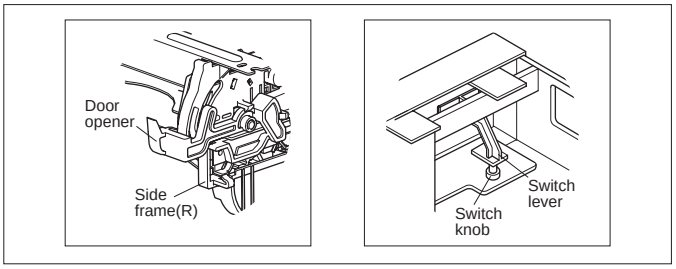


Fig. 1-2-2a

<Note 3a>

- When reattaching the Mechanism assembly, secure the screws (S3a to S3b) in the order of a, b.

<Note 3b>

- When reattaching the Mechanism assembly, be sure to align the phase of the Rotary encoder on the Main board assembly.
- When reattaching the Mechanism assembly, set the “Mechanism assembling mode”. (See “section 2 mechanism”.)
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors and switch on the Main board assembly.

<Note 3c>

- When reattaching the Drum assembly, secure the screws (S3x to S3z) in the order of x, y, z.

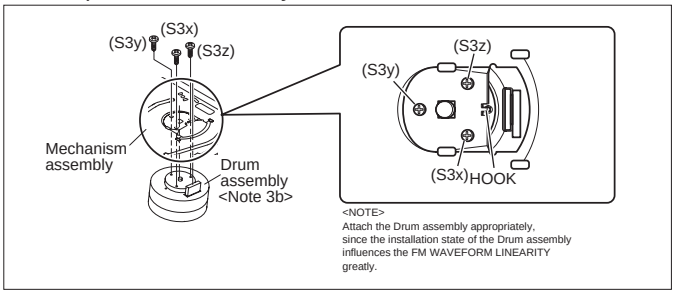


Fig. 1-2-2b

- When handling the drum assembly alone, hold it by the motor or shaft. Be careful not to touch other parts, especially the video heads. Also take care not to damage the connectors.

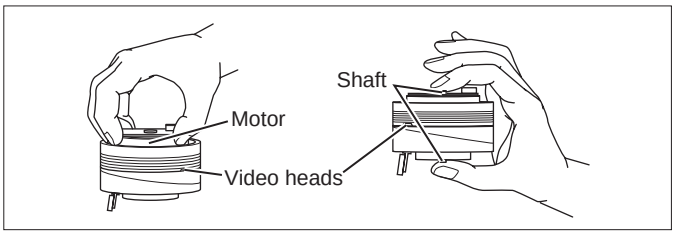


Fig. 1-2-2c

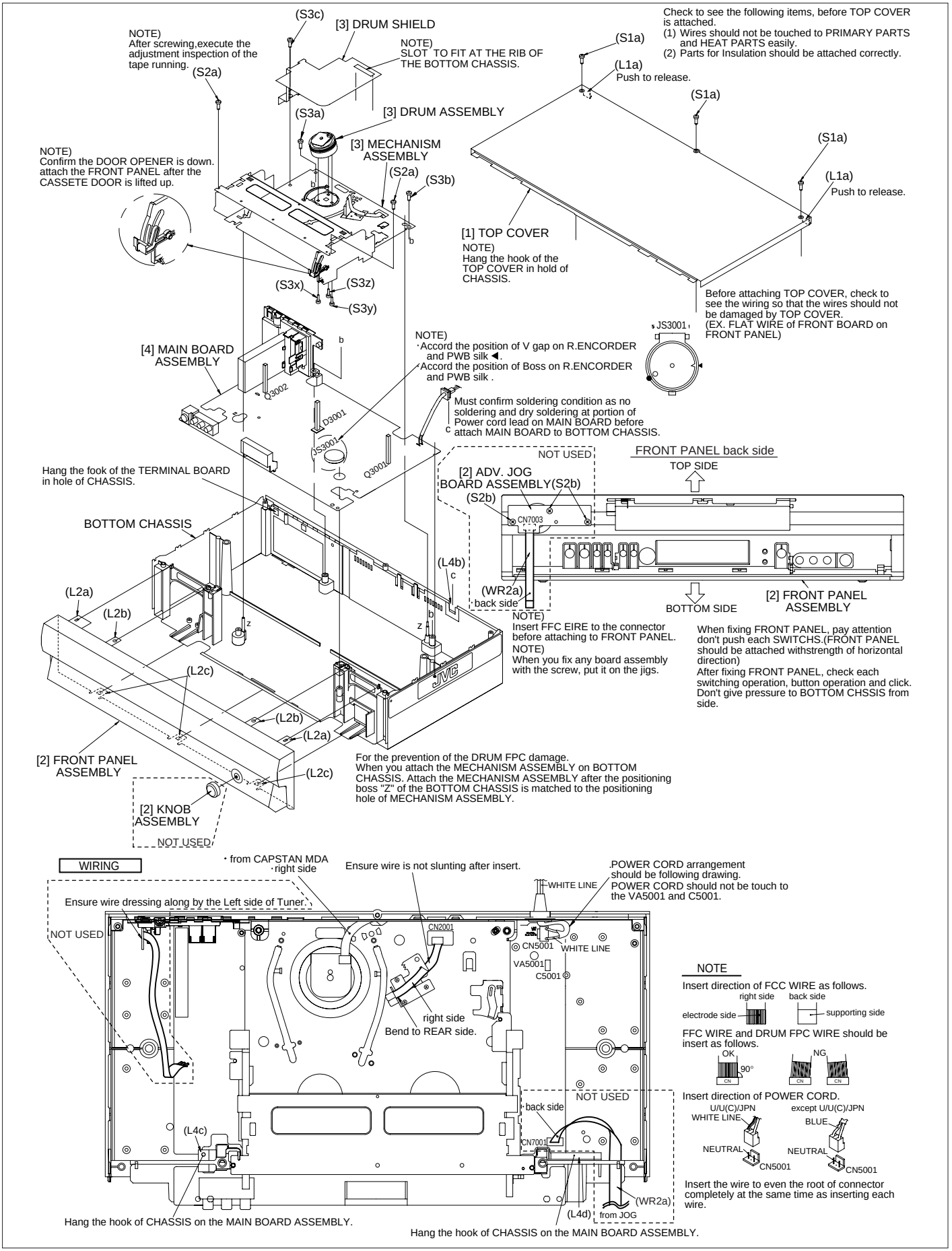

(S3c)
[3] DRUM SHIELD
NOTE)
After screwing,execute the adjustment inspection of the tape running.
NOTE)
SLOT TO FIT AT THE RIB OF THE BOTTOM CHASSIS.
(S2a)
(S3a)
[3] DRUM ASSEMBLY
[3] MECHANISM ASSEMBLY
(S2a)
(S3b)
NOTE)
Confirm the DOOR OPENER is down. attach the FRONT PANEL after the CASSETE DOOR is lifted up.
(S3x)
(S3z)
(S3y)
Check to see the following items, before TOP COVER is attached.
(1) Wires should not be touched to PRIMARY PARTS and HEAT PARTS easily.
(2) Parts for Insulation should be attached correctly.
(S1a)
(L1a)
Push to release.
(S1a)
(S1a)
(L1a)
Push to release.
[1] TOP COVER
NOTE)
Hang the hook of the TOP COVER in hold of CHASSIS.
Before attaching TOP COVER, check to see the wiring so that the wires should not be damaged by TOP COVER.
(EX. FLAT WIRE of FRONT BOARD on FRONT PANEL)
JS3001
[4] MAIN BOARD ASSEMBLY
NOTE)
・Accord the position of V gap on R.ENCORDER and PWB silk ◀.
・Accord the position of Boss on R.ENCORDER and PWB silk .
Q3002
D3001
JS3001
Q3001
Must confirm soldering condition as no soldering and dry soldering at portion of Power cord lead on MAIN BOARD before attach MAIN BOARD to BOTTOM CHASSIS.
NOT USED
FRONT PANEL back side
TOP SIDE
[2] ADV. JOG BOARD ASSEMBLY(S2b)
(S2b)
CN7003
Hang the fook of the TERMINAL BOARD in hole of CHASSIS.
BOTTOM CHASSIS
(L4b)
(L2a)
(L2b)
(WR2a)
back side
BOTTOM SIDE
[2] FRONT PANEL ASSEMBLY
NOTE)
Insert FFC EIRE to the connector before attaching to FRONT PANEL.
NOTE)
When you fix any board assembly with the screw, put it on the jigs.
When fixing FRONT PANEL, pay attention don't push each SWITCHS.(FRONT PANEL should be attached withstrength of horizontal direction)
After fixing FRONT PANEL, check each switching operation, button operation and click.
Don't give pressure to BOTTOM CHSSIS from side.
(L2c)
(L2b)
(L2a)
[2] FRONT PANEL ASSEMBLY
(L2c)
For the prevention of the DRUM FPC damage.
When you attach the MECHANISM ASSEMBLY on BOTTOM CHASSIS. Attach the MECHANISM ASSEMBLY after the positioning boss "Z" of the BOTTOM CHASSIS is matched to the positioning hole of MECHANISM ASSEMBLY.
[2] KNOB ASSEMBLY
NOT USED
WIRING
・from CAPSTAN MDA
・right side
Ensure wire is not slunting after insert.
WHITE LINE
POWER CORD arrangement should be following drawing.
POWER CORD should not be touch to the VA5001 and C5001.
Ensure wire dressing along by the Left side of Tuner.
NOT USED
CN2001
CN5001
WHITE LINE
VA5001
C5001
right side
Bend to REAR side.
NOT USED
back side
CN7001
(L4c)
(WR2a)
from JOG
(L4d)
Hang the hook of CHASSIS on the MAIN BOARD ASSEMBLY.
Hang the hook of CHASSIS on the MAIN BOARD ASSEMBLY.
NOTE
Insert direction of FCC WIRE as follows.
right side
back side
electrode side
supporting side
FFC WIRE and DRUM FPC WIRE should be insert as follows.
OK
90°
NG
CN
Insert direction of POWER CORD.
U/U(C)/JPN
except U/U(C)/JPN
WHITE LINE
BLUE
NEUTRAL
NEUTRAL
CN5001
CN5001
Insert the wire to even the root of connector completely at the same time as inserting each wire.

Fig. 1-2-2d

1.3 Emergency display function

This unit saves details of the last two emergencies as the EMG history and allows the status of the VCR and the mechanism of each emergency to be shown both on the display and as OSD information.
When using the emergency function, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).

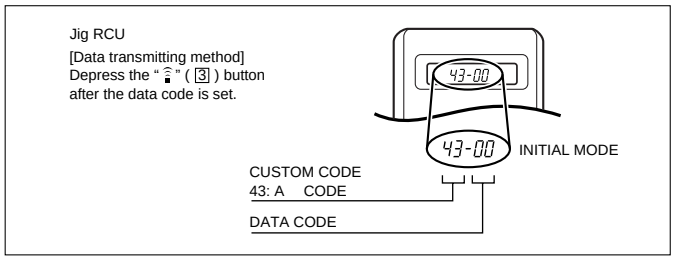


Fig. 1-3a Jig RCU [PTU94023B]

1.3.1 Displaying the EMG information

The EMG detail of information can be displayed by transmitting the code "59" from the Jig RCU.

Note:

- ***The EMG detail information <1><2> show the information on the latest EMG.***
  It becomes " – – : – – : – –" when there is no latest EMG record.

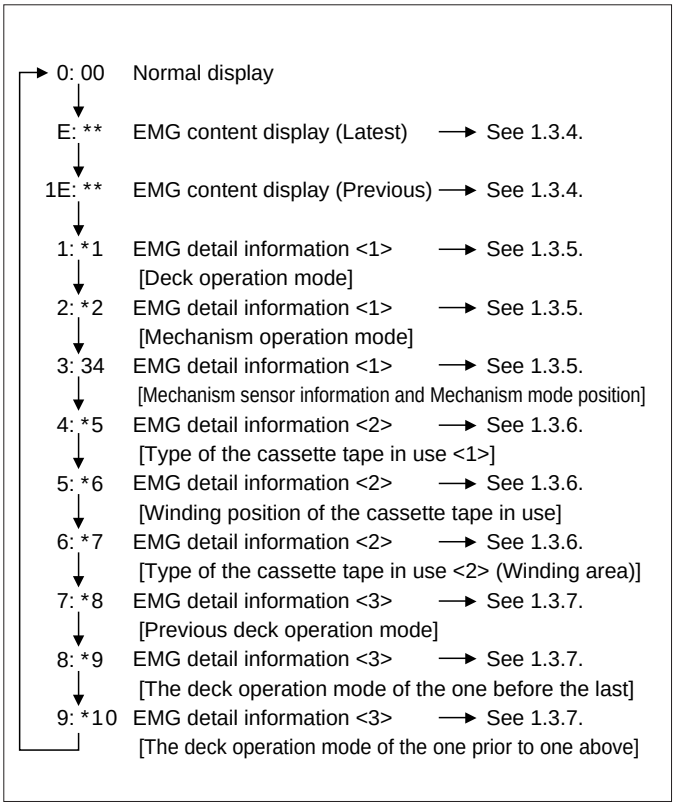

0: 00 Normal display
E: ** EMG content display (Latest) → See 1.3.4.
1E: ** EMG content display (Previous) → See 1.3.4.
1: *1 EMG detail information <1> → See 1.3.5.
[Deck operation mode]
2: *2 EMG detail information <1> → See 1.3.5.
[Mechanism operation mode]
3: 34 EMG detail information <1> → See 1.3.5.
[Mechanism sensor information and Mechanism mode position]
4: *5 EMG detail information <2> → See 1.3.6.
[Type of the cassette tape in use <1>]
5: *6 EMG detail information <2> → See 1.3.6.
[Winding position of the cassette tape in use]
6: *7 EMG detail information <2> → See 1.3.6.
[Type of the cassette tape in use <2> (Winding area)]
7: *8 EMG detail information <3> → See 1.3.7.
[Previous deck operation mode]
8: *9 EMG detail information <3> → See 1.3.7.
[The deck operation mode of the one before the last]
9: *10 EMG detail information <3> → See 1.3.7.
[The deck operation mode of the one prior to one above]

Fig. 1-3-1a EMG display of 7segment LED display model

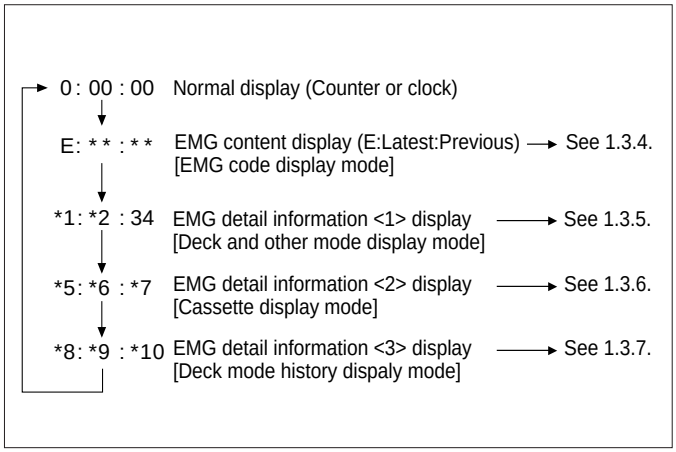

0 : 00 : 00 Normal display (Counter or clock)
E: * * : * * EMG content display (E:Latest:Previous) → See 1.3.4.
[EMG code display mode]
*1: *2 : 34 EMG detail information <1> display → See 1.3.5.
[Deck and other mode display mode]
*5: *6 : *7 EMG detail information <2> display → See 1.3.6.
[Cassette display mode]
*8: *9 : *10 EMG detail information <3> display → See 1.3.7.
[Deck mode history dispaly mode]

Fig. 1-3-1b EMG display of FDP display model

<Reference> EMG display of FDP display mode

(1) Transmit the code "59" from the Jig RCU.
The FDP shows the EMG content in the form of "E: * * : * * ".

<Example 1> E : 01 : 03
Previous EMG
Latest EMG

<Example 2> E : – – : – – ← No EMG record

(2) Transmit the code "59" from the Jig RCU again.
The FDP shows the EMG detail information <1> in the form of " * 1 : * 2 : 34 ".
- * 1 : Deck operation mode at the moment of EMG
- * 2 : Mechanism operation mode at the moment of EMG
- 3– : Mechanism sensor information at the moment of EMG
- –4 : Mechanism mode position at the moment of EMG

(3) Transmit the code "59" from the Jig RCU once again.
The FDP shows the EMG detail information <2> in the form of " * 5 : * 6 : * 7 ".
- * 5 : Type of the cassette tape in use <1> .
- * 6 : Winding position of the cassette tape in use
- * 7 : Type of the cassette tape in use <2> (Winding area)

(4) Transmit the code "59" from the Jig RCU once again.
The FDP shows the EMG detail information <3> in the form of "*8 : *9 : *10".
- * 8 : Previous deck operation mode at the moment of EMG
- * 9 : The deck operation mode of the one before the last at the moment of EMG
- * 10 : The deck operation mode of the one prior to one above at the moment of EMG

(5) Transmit the code "59" from the Jig RCU once again to reset the display.

1.3.2 Clearing the EMG history

(1) Display the EMG history.
(2) Transmit the code "36" from the Jig RCU.
(3) Reset the EMG display.

1.3.3 Details of the OSD display in the EMG display mode

During the EMG display, the OSD shows the data on the deck mode, etc. The details of the display contents are as follows.

Notes:

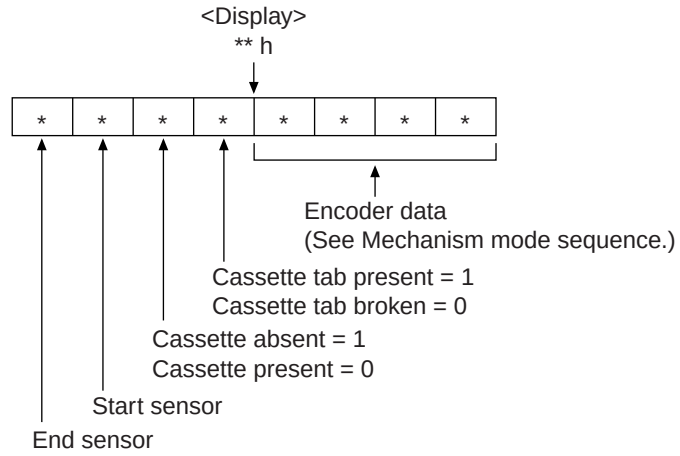
- ***The display is variable depending on the part No. of the System Control microcomputer (IC3001) built into the VCR. In the following, refer to the figure carrying the same two characters as the top two characters of the part number of your IC.***
- ***The sensor information in the OSD display contents is partially different from the mechanism sensor information in EMG detail information <1>.***

[For MN* only]

AA	BB	CC	DD	EE
FF	GG	HH	I I	J J
KK	L L	MM	NN	OO
PP	QQ	RR	SS	TT
UU	VV	WW	XX	YY

A A : Deck operation mode (See EMG detail information <1>.)
B B : Mechanism operation mode (See EMG detail of information <1>.)
C C : Mechanism transition flag
D D : Capstan motor control status
E E : Loading motor control status
F F : Sensor information (See sensor information details.)
GG : Capstan motor speed
HH : Key code (JVC code)
I I : Supply reel winding diameter data, higher 8 bits.
J J : Supply reel winding diameter data, lower 8 bits.
KK : Mechanism sensor information & mechanism mode position (See EMG detail of information <1>.)
L L : Tape speed data, higher 8 bits.
MM : Tape speed data, lower 8 bits.
N N : Cassette tape type <2>, higher 8 bits. (See EMG detail of information <2>.)
OO : Cassette tape type <2>, lower 8 bits. (See EMG detail of information <2>.)
P P : General data display area
| |
Y Y : General data display area

***FF: Sensor information details**

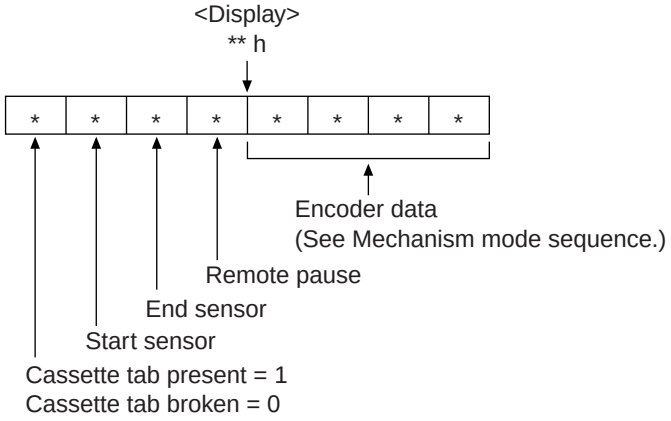


[For *HD only]

AA	BB	CC
DD	EE	FF
GGGG	HHHH	
I I	J J J J	
KKKK	L L L L	MMMM
ROM No.		

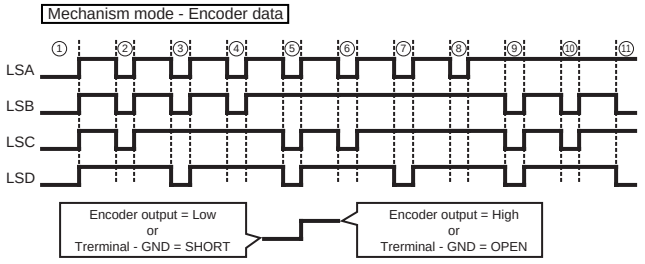
A A : Key code (JVC code)
B B : Deck operation mode (See EMG detail information <1>.)
C C : Mechanism operation mode (See EMG detail information <1>.)
D D : Sensor information (See sensor information details.)
E E : Capstan motor speed (Search, double speed)
F F : Tracking value
GGGG : Cassette tape type <2>, 16 bits. (See EMG detail information <2>.)
HHHH : Supply reel winding diameter data
I I : Capstan motor speed (FF/REW, double speed)
J J J J : Tape speed data, lower 8 bits.
K K K K : General data display area
L L L L : General data display area
MMMM : General data display area

***DD: Sensor information details**

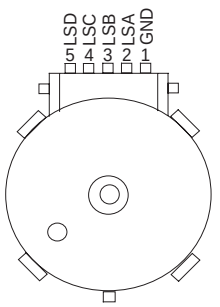


[For both MN*/HD*]

Mechanism mode sequence



No.	Position	Encoder data
①	EJECT	0 h = 0000
②	EJECT1	1 h = 0001
③	EJECT2	2 h = 0010
④	ULSTOP	3 h = 0011
⑤	UPPER	4 h = 0100
⑥	ONSTOP(PLAY)	5 h = 0101
⑦	FWD/SS	6 h = 0110
⑧	REV/SS	7 h = 0111
⑨	OFFSTOP	8 h = 1000
⑩	FFREW-BRAKE	9 h = 1001
⑪	FFREW	A h = 1010
⑫	MIDDLE	F h = 1111



1.3.4 EMG content description

Note: ***EMG contents "E08/E09" are for the model with Dynamic Drum (DD).***

FDP	CONTENT	CAUSE
E01: Loading EMG	If the mechanism mode does not change to the next mode within 4 seconds after the loading motor starts rotating in the loading direction, while the mechanism is in the after-loading position (with the tape up against the pole base), [E:01] is identified and the power is switched OFF. However, if the tape loading is not completed within 4 seconds after the loading motor starts rotating in the loading direction, the tape is simply unloaded and ejected. No EMG data is recorded in this case.	1. The mechanism is locked in the middle of the mode transition during a tape loading operation. 2. The mechanism overruns during the tape loading operation because the SYSCON cannot recognize the mechanism mode normally. This problem is due to a cause such as a rotary encoder failure. 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E02: Unloading EMG	When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the unloading direction, [E:02] is identified and the power is turned off.	1. The mechanism is locked in the middle of mode transition. 2. Without an eject signal being sent from the SYSCON, unloading is attempted (i.e. Ejection is attempted while the tape is still inside the mechanism.) because the SYSCON cannot recognize the mechanism mode normally. This is due to a cause such as a rotary encoder failure. (Mechanism position: UPPER) 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E03: Take Up Reel Pulse EMG	When the falling edje of the take-up reel pulse has not been generated for more than 4 seconds in the capstan rotating mode, [E:03] is identified, the pinch rollers are turned off and stopped, and the power is turned off. In this case, however, the mechanism should be in position after tape loading. Note that the reel EMG is not detected during Slow/Frame advance operations.	1. The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because; 1)The idler gear is not meshed with the take-up reel gear because the mechanism malfunctions for some reason. 2)The idler gear is meshed with the take-up reel gear, but incapable of winding due to too large mechanical load (abnormal tension); 3)The reel is rotating normally but an FG pulse is not generated due to the take-up reel sensor failure. 2. The supply reel pulse is not generated in the REV transport modes (REV SEARCH/REW, etc.) because; 1) The idler gear is not meshed with the supply reel gear because the mechanism malfunctions for some reason. 2) The idler gear is meshed with the supply reel gear, but incapable of winding due to too large a mechanical load (abnormal tension); 3) The reel rotates normally but the FG pulse is not generated due to a supply reel sensor failure. 3. Power(SW5V) is not supplied to the reel sensor on the tape winding side.
E04: Drum FG EMG	When the drum FG pulse has not been input for more than 3 seconds in the drum rotating mode, [E:04] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The drum could not start or the drum rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high; 2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape. 2. The drum FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (hall device) of the drum is faulty. 3. The drum control voltage (DRUM CTL V) is not supplied to the MDA. 4. Power (M12V) is not supplied to the drum MDA.
E05: Cassette Eject EMG	If the cassette does not reach the eject position within about 0.7 seconds after the cassette housing has started the cassette ejection operation, [E:05] is identified, the drive direction is reversed to load the tape, the mode is switched to STOP mode with the pinch roller OFF, and the power is switched OFF. During the cassette insertion process, the drive direction is reversed and the cassette is ejected if the tape is not up against the pole base within about 3 seconds after the start of the cassette pulling-in operation. If the cassette does not reach the eject position within about 0.7 seconds after the drive mode reversal operation, [E:05] is identified and the power is switched OFF immediately.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing factors: Temperature environment (low temperature, etc.), mechanism wear or failure. 3. The sensor/switch for detecting the end of ejection are not functioning normally. 4. The loading motor drive voltage is lower than specified or power (M12V) is not supplied to the motor (MDA). 5. When the user attempted to eject a cassette, a foreign object (or perhaps the user's hand) was caught in the opening of the housing.
E06: Capstan FG EMG	When the capstan FG pulse has not been generated for more than 1 second in the capstan rotating mode, [E:06] is identified, the pinch rollers are turned off and stopped, and the power is turned off.However, the capstan EMG is not detected in SLOW/STILL modes. Note that, if the part number of the System Control IC begins with "MN" or "M3", the capstan EMG is not detected even during the FF/REW operation.	1. The capstan could not start or the capstan rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high (mechanical lock); 2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occurrence of tape entangling, etc.). 2. The capstan FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (MR device) of the capstans is faulty. 3. The capstan control voltage (CAPSTAN CTL V) is not supplied to the MDA. 4. Power (M12V, SW5V) are not supplied to the capstan MDA.
E07: SW Power Short-Circuit EMG	When short-circuiting of the SW power supply with GND has lasted for 0.5 second or more, [E:07] is identified, all the motors are stopped and the power is turned off.	1. The SW 5 V power supply circuit is shorted with GND. 2. The SW 12 V power supply circuit is shorted with GND.
E08: DD Initialized (Absolute Position Sensor) EMG	When DD tilting does not complete in 4 seconds, [E:08] is identified, the tilt motor is stopped and the power is turned off.	1. The absolute value sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the absolute sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the absolute value sensor. 4. The absolute value sensor data is not sent to the System Controller CPU.
E09: DD FG EMG	When the DD FG pulse is not generated within 2.5 seconds, [E:09] is identified, the tilt motor is stopped and the power is turned off.	1. The FG sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the FG sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the FG sensor. 4. The power (5V) to the sensor is not supplied. (Connection failure/soldering failure) 5. The FG pulse is not sent to the System Controller CPU. 6. The tilt motor is defective. (The soldered parts have separated.) 7. The drive power to the tilt motor is not supplied. (Connection failure/soldering failure) 8. The tilt motor drive MDA - IC is defective. 9. Auto-recovery of the DD tilting cannot take place due to overrun.
E0A: Supply Reel Pulse EMG	When the falling edge of the supply reel pulse has not been generated for more than 10 seconds in the capstan rotating mode, [E:0A] is identified and the cassette is ejected (but the power is not turned off). In this case, however, the mechanism should be in the position after tape loading (with the tape up against the pole base). Also note that the reel EMG is not detected during Slow/Frame advance operations.	1. The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF, etc.) because; 1) PLAY/FWD or SEARCH/FF is started while the tape in the inserted cassette is cut in the middle; 2) A mechanical factor caused tape slack inside and outside the supply reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the FWD transport, so the pulse is not generated until then; 3) The reel is rotating normally but the FG pulse is not generated due to a supply reel sensor failure. 2. The take-up reel pulse is not generated in the REV transport mode (REV SEARCH/REW, etc.). 1) REV SEARCH/REW is started when the tape in the inserted cassette has been cut in the middle; 2) A mechanical factor caused tape slack inside and outside the take-up reel side of the cassette shell. In this case, the take-up reel will not rotate until the tape slack is removed by the REV transport, so the pulse will not be generated until that time; 3) The reel is rotating normally but the FG pulse is not generated due to a take-up reel sensor failure. 3. The power (SW 5V) to a reel sensor is not supplied.
EU1: Head clog warning history	Presupposing the presence of the control pulse output in the PLAY mode, when the value obtained by mixing the two V.FM output channels (without regard to the A.FM output) has remained below a certain threshold level for more than 10 seconds, [E:U1] is identified and recorded in the emergency history. During the period in which the head clog is detected, the FDP shows "U:01" and the OSD repeats the "3 seconds of warning display" and the "7 seconds of noise picture display" alternately. EMG code : "E:C1" or "E:U1" / FDP : "U:01" / OSD : "Try cleaning tape." or "Use cleaning cassette." The head clog warning is reset when the above-mentioned threshold has been exceeded for more than 2 seconds or the mode is changed to another mode than PLAY.	

Table 1-3-4a

1.3.5 EMG detail information <1>

The status (electrical operation mode) of the VCR and the status (mechanism operation mode/sensor information) of the mechanism in the latest EMG can be confirmed based on the figure in EMG detail information <1> .

[FDP/OSD display]

*1 : *2 : 34

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3– : Mechanism sensor information at the moment of EMG
–4 : Mechanism mode position at the moment of EMG

Note:

- ***For EMG detailed information <1>, the content of the code that is shown on the display (or OSD) differs depending on the parts number of the system control microprocessor (IC3001) of the VCR. The system control microprocessor parts number starts with two letters, refer these to the corresponding table.***

***1 : Deck operation mode**
[Common table of MN* and HD]

Display		Deck operation mode
MN*	HD*	
00	-	Mechanism being initialized
01	00	STOP with pinch roller pressure off (or tape present with P.OFF)
02	01	STOP with pinch roller pressure on
03	-	POWER OFF as a result of EMG
04	04	PLAY (Normal playback)
0C	0E	REC
10	11	Cassette ejected
20	22	FF
21	-	Tape fully loaded, START sensor ON, short FF
22	-	Cassette identification FWD SEARCH before transition to FF (SP x7-speed)
24	26	FWD SEARCH (variable speed) including x2-speed
2C	2E	INSERT REC
40	43	REW
42	-	Cassette identification REV SEARCH before transition to REW (SP x7-speed)
44	47	REV SEARCH (variable speed)
4C	4C	AUDIO DUB
6C	6E	INSERT REC (VIDEO + AUDIO)
84	84	FWD STILL / SLOW
85	85	REV STILL / SLOW
8C	8F	REC PAUSE
8D	-	Back spacing
8E	-	Forward spacing (FWD transport mode with BEST function)
AC	AF	INSERT REC PAUSE
AD	-	INSERT REC back spacing
CC	CD	AUDIO DUB PAUSE
CD	-	AUDIO DUB back spacing
EC	EF	INSERT REC (VIDEO + AUDIO) PAUSE
ED	-	INSERT REC (VIDEO + AUDIO) back spacing

***2 : Mechanism operation mode**
[Table of MN*]

Display	Mechanism operation mode
00	Command standby (No command to be executed)
01	Immediate Power OFF after EMG occurrence
02	Loading from an intermediate position during mechanism initialization
03	Unloading due to EMG occurrence during mechanism initialization
04	Ejecting cassette (ULSTOP to EJECT)
05	Inserting cassette (EJECT to ULSTOP)
06	Loading tape (ULSTOP to PLAY)
07	Unloading tape (PLAY to ULSTOP)
08	Transition from pinch roller ON to STOP
09	Transition from pinch roller OFF to STOP (PLAY to OFFSTOP)
0A	Transition from pinch roller OFF to STOP at power OFF
0B	Transition from pinch roller ON to STOP at power ON
0C	Transition to PLAY
0D	Transition to Search FF
0E	Transition to REC
0F	Transition to FWD STILL/SLOW
10	Transition to REV STILL/SLOW
11	Transition to Search REV
12	Transition from FF/REW to STOP
13	Transition to FF
14	Transition to REW
15	Tape end detection processing during loading
16	Short FWD/REV at tape sensor ON during unloading
17	Transition to FF/REW brake mode

[Table of HD*]

Display	Mechanism operation mode
00	STOP with pinch roller pressure off
01	STOP with pinch roller pressure on
02	U/L STOP (or tape being loaded)
04	PLAY (Normal playback)
05	PLAY (x1-speed playback using JOG)
0E	REC
11	Cassette ejected
22	FF
26	FWD SEARCH (variable speed) including x2-speed
2E	INSERT REC
43	REW
47	REV SEARCH
4C	AUDIO DUB
6E	INSERT REC (VIDEO + AUDIO)
84	FWD STILL/SLOW
85	REV STILL/SLOW
8F	REC PAUSE
AF	INSERT REC PAUSE
C7	REV SEARCH (x1-speed reverse playback using JOG)
CD	AUDIO DUB PAUSE
EF	INSERT REC (VIDEO + AUDIO) PAUSE
F0	Mechanism being initialized
F1	POWER OFF as a result of EMG
F2	Cassette being inserted
F3	Cassette being ejected
F4	Transition from STOP with pinch roller pressure on to STOP with pinch roller pressure off
F5	Transition from STOP with pinch roller pressure on to PLAY
F6	Transition from STOP with pinch roller pressure on to REC
F7	Cassette type detection SEARCH before FF/REW is being executed
F8	Tape being unloaded
F9	Transition from STOP with pinch roller pressure off to STOP with pinch roller pressure on
FA	Transition from STOP with pinch roller pressure off to FF/REW
FB	Transition from STOP with pinch roller pressure off to REC.P (T.REC,etc.)
FC	Transition from STOP with pinch roller pressure off to cassette type detection SEARCH
FD	Short REV being executed after END sensor on during unloading
FE	Tension loosening being executed after tape loading (STOP with pinch roller pressure on)
FF	Tape being unloaded

3– : Mechanism sensor information
[Common table of MN* and HD*]

Display	Mechanism sensor information			
	REC safety SW	Start sensor	End sensor	Mechansim position sensor
0-	Tab broken	ON	ON	ON
1-	Tab broken	ON	ON	OFF
2-	Tab broken	ON	OFF	ON
3-	Tab broken	ON	OFF	OFF
4-	Tab present	OFF	ON	ON
5-	Tab present	OFF	ON	OFF
6-	Tab present	OFF	OFF	ON
7-	Tab present	OFF	OFF	OFF
8-	Tab broken	ON	ON	ON
9-	Tab broken	ON	ON	OFF
A-	Tab broken	ON	OFF	ON
B-	Tab broken	ON	OFF	OFF
C-	Tab present	OFF	ON	ON
D-	Tab present	OFF	ON	OFF
E-	Tab present	OFF	OFF	ON
F-	Tab present	OFF	OFF	OFF

Tab broken = 0 Sensor ON = 0 Sensor ON = 0
Tab present = 1 sensor OFF = 1 Sensor OFF = 1

–4 : Mechanism mode position
[Common table of MN* and HD*]

Mechanism sensor information	Display	Deck operation mode	
Even number (0, 2, 4, 6, 8, A, C, E)	-0	Not established	
	-1	EJECT	EJECT position
	-2	EJECT-EJECT1	Intermodal position
	-3	EJECT1	EJECT1 position
	-4	EJECT1-EJECT2	Intermodal position
	-5	EJECT2	EJECT2 position
	-6	EJECT2-ULSTOP	Intermodal position
	-7	ULSTOP	ULSTOP position
	-8	ULSTOP-UPPER	Intermodal position
	-9	UPPER	Loading (unloading) tape
	-A	UPPER-ONSTOP	Intermodal position
	-B	ONSTOP	PLAY position
	-C	PLAY-FWD/SS	Intermodal position
	-D	FWD/SS	FWD (FWD Still/Slow) position
	-E	FWD/SS-REV	Intermodal position
	-F	REV	REV (REV Still/Slow) position
Odd number (1, 3, 5, 7, 9, B, D, F)	-0	REV-OFFSTOP	Intermodal position
	-1	OFFSTOP	Pinch roller OFF position
	-2	OFFSTOP-FFREWB	Intermodal position
	-3	FFREWB	FF/REW Brake position
	-4	FFREWB-FFREW	Intermodal position
	-5	FFREW	FF/REW position

1.3.6 EMG detail information <2>

The type of the cassette tape and the cassette tape winding position can be confirmed based on the figure in EMG detail information <2> .

[FDP/OSD display]

*5 :*6 :*7

*5 : Type of the cassette tape in use <1>
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use <2> (Winding area)

Note:

- ***EMG detail information <2> is the reference information stored using the remaining tape detection function of the cassette tape. As a result, it may not identify cassette correctly when a special cassette tape is used or when the tape has variable thickness.***

***5 : Cassette tape type <1>**

Display	Cassette tape type <1>
00	Cassette type not identified
16	Large reel/small reel (T-0 to T-15/T-130 to T-210) not classified
82	Small reel, thick tape (T-120) identified/thin tape (T-140) identified
84	Large reel (T-0 to T-60) identified
92	Small reel, thick tape (T-130) identified/thin tape (T-160 to T-210) identified
93	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) not classified
C3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
D3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
E1	C cassette, thick tape (TC-10 to TC-20) identified
E2	Small reel, thick tape (T-0 to T-100) identified
E9	C cassette, thin tape (TC-30 to TC-40) identified
F1	C cassette, thick tape/thin tape (TC-10 to TC-40) not classified

Notes:

- ***Cassette tape type <1> is identified a few times during mode transition and the identification count is variable depending on the cassette tape type. If an EMG occurs in the middle of identification, the cassette tape type may not be able to be identified.***
- ***If other value than those listed in the above table is displayed, the cassette tape type is not identified.***

***6 : Cassette tape winding position**

The cassette tape winding position at the moment of EMG is displayed by dividing the entire tape (from the beginning to the end) in 21 sections using a hex number from “00” to “14”.

“00” : End of winding
“14” : Beginning of winding
“FF” : Tape position not identified

***7 : Cassette tape type <2> (Winding area)**

Display	Cassette tape type <2>		(Reference) Word data (Beginning) (End)
00	Cassette type not identified		
04 - 08	C cassette, thick tape	TC-10	(0497 - 0506) (0732 - 0858)
05 - 06	Small reel, thick tape	T-20	(05A9 - 0661)
05 - 0C	C cassette, thick tape	TC-20P	(0599 - 05FF) (0AA1 - 0C07)
06 - 0C	C cassette, thin tape	TC-40	(0623 - 063D) (0C41 - 0CC3)
06 - 0C	C cassette, thin tape	TC-30	(0611 - 0638) (0C0C - 0CB2)
07 - 08	Small reel, thick tape	T-40	(07CC - 08E5)
09 - 0B	Small reel, thick tape	T-60	(09FD - 0B78)
0C - 0D	Small reel, thick tape	T-80(DF-160)	(0C20 - 0DFC)
0D - 0F	Small reel, thick tape	T-90(DF-180)	(0D31 - 0F3E)
0E - 10	Small reel, thick tape	T-100	(0E43 - 107F)
10 - 12	Small reel, thin tape	T-140	(10E1 - 120C)
10 - 13	Small reel, thick tape	T-120(DF-240)	(1073 - 1313)
11 - 14	Small reel, thick tape	T-130	(1185 - 1429)
12 - 14	Small reel, thin tape	T-160	(12D3 - 141F)
13 - 14	Small reel, thin tape	T-210(DF-420)	(1373 - 14C3)
13 - 14	Small reel, thin tape	T-180(DF-360)	(1357 - 14C0)
13 - 14	Small reel, thin tape	T-168	(1395 - 14EE)
13 - 14	Small reel, thick tape	DF-300	(13A8 - 14CE)
15 - 16	Large reel	T-20	(1536 - 1618)
16 - 17	Large reel	T-30	(1647 - 175A)
17 - 18	Large reel	T-40	(1759 - 189C)
19 - 1B	Large reel	T-60	(1989 - 1B2F)

Note:

- ***The values of cassette tape type <2> in the above table are typical values with representative cassette tapes.***

1.3.7 EMG detail information <3>

Three deck operation modes preceding the deck operation mode in which the EMG occurs may be confirmed based on the figures in the EMG information detail <3>. For the contents of the displayed information, see the table "Deck operation mode" in section "1.3.5 EMG detail information <1>".

1.4 Service position

This unit has been designed so that the Mechanism and Main board assemblies can be removed together from the chassis assembly. Before diagnosing or servicing the circuit boards, take out the major parts from the chassis assembly.

1.4.1 How to set the “Service position”

(1) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the Mechanism assembly.
(2) Remove the screws that fix the Mechanism assembly to the Chassis assembly. If any other screws are used to fix the boards, remove them also.
(3) Remove the combined Mechanism and Main board assemblies.
(4) If any other major parts are used, remove them also.
(5) Connect the wires and connectors of the major parts that have been removed in steps (1) to (4). (Refer to Fig. 1-2-2d.)
(6) Place the combined Mechanism, Main board and other board assemblies upside down.
(7) Insert the power cord plug into the power outlet and then proceed with the diagnostics and servicing of the board assembly.

Notes:

- ***Before inserting the power cord plug into the power outlet, make sure that none of the electrical parts are able to short-circuit between the workbench and the board assembly.***
- ***For the disassembly procedure of the major parts and details of the precautions to be taken, see “1.2 Removing the major parts”.***
- ***If there are wire connections from the Main board and Mechanism assemblies to the other major parts, be sure to remove them (including wires connected to the major parts) first before performing step (2).***
- ***When carrying out diagnosis and repair of the Main board assembly in the “Service position”, be sure to ground both the Main board and Mechanism assemblies. If they are improperly grounded, there may be noise on the playback picture or FDP counter display may move even when the mechanism is kept in an inoperative status.***
- ***In order to diagnose the playback or recording of the cassette tape, set the Mechanism assembly to the required mode before placing it upside down. If the mechanism mode is changed (including ejection) while it is in an upside down position the tape inside may be damaged.***
- ***For some models, the mechanism and board assemblies are attached by connectors only. When carrying out a diagnosis or repair of the boards in the “Service position”, make sure that the connectors are not disconnected.***

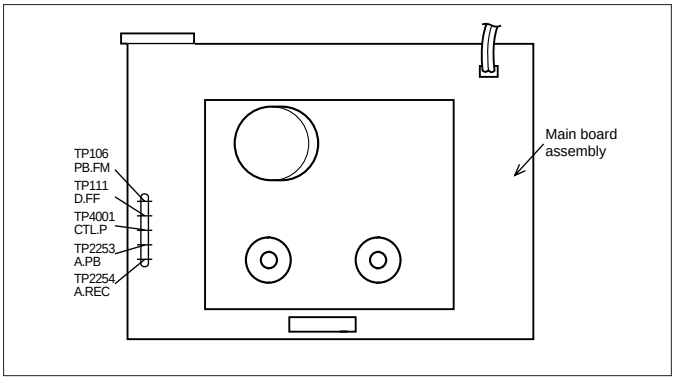


Fig. 1-4-1a

1.5 Jig RCU mode

This unit uses the following two modes for receiving remote control codes.

1) User RCU mode : Ordinary mode for use by the user.
2) Jig RCU mode : Mode for use in production and servicing.

When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). As both of the above two modes are stored in the EEPROM, it is required to set the VCR back to the User RCU mode each time that an adjustment is made or to check that the necessary operations have been completed. These modes can be set by the operations described below.

1.5.1 Setting the Jig RCU mode

(1) Unplug the power cord plug from the power outlet.
(2) Press and hold the “REC” and “PAUSE” buttons on the VCR simultaneously, while plugging the power cord plug into the power outlet.
When the VCR is set to the Jig RCU mode, the symbols (“ : ”) in the time display of the FDP are turned off.

1.5.2 Setting the User RCU mode

(1) Turn off the power.
(2) Press the “REC” and “PAUSE” buttons of the VCR simultaneously. Alternatively, transmit the code “80” from the Jig RCU.

1.6 Mechanism service mode

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the “Mechanism service mode”.

1.6.1 How to set the “Mechanism service mode”

(1) Set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).
(2) Transmit the code “E5” from the Jig RCU.
(3) Release the lug of the Cassette holder and then slide the Cassette holder toward the direction where the Cassette holder is loaded by manually.
(4) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.
When the VCR is set to the Mechanism service mode, the symbols (“Timer”) in the FDP (LED) are blinked.

1.6.2 How to exit from the "Mechanism service mode"

(1) Unplug the power cord plug from the power outlet.

1.7 Maintenance and inspection

1.7.1 Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.
When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

Note:

- ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.
(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.
(3) After cleaning, make sure that the cleaned parts are completely dry before using the cassette tape.

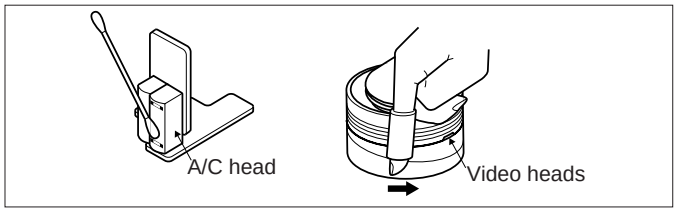


Fig. 1-7-1a

1.7.2 Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

Note:

- ***See the "mechanism assembly" diagram of the "parts list" for the lubricating or greasing spots, and for the types of oil or grease to be used.***

1.7.3 Suggested servicing schedule for main components

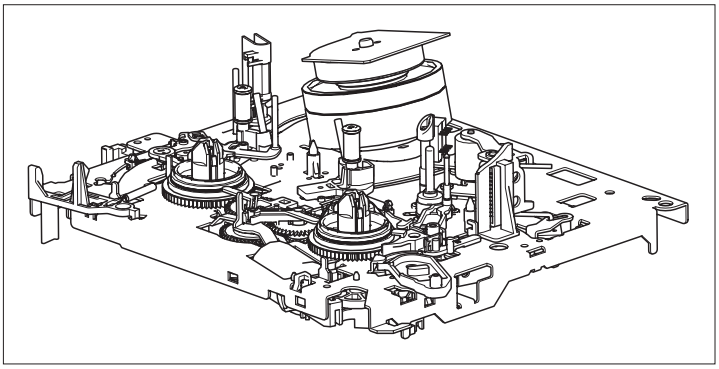
The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts name	Operation hours	
		1000H	2000H
Tape transport	Drum assembly	C,X	X
	A/C head	C,X	C,X
	Pinch roller arm assembly	C	C
	Full erase head	C	C
	Tension arm assembly	C	C
	Capstan motor (Shaft)	C	C
	Guide arm assembly	C	C
Drive	Capstan motor		X
	Capstan brake assembly		X
	Main brake assembly		X
	Belt (Capstan)	X	X
	Loading motor		X
	Clutch unit		X
	Worm gear		X
	Control plate		X
Other	Rotary encoder		X

C : Cleaning
X : Inspection or Replacement if necessary

SECTION 2
MECHANISM

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700(MECHANISM ASSEMBLY).



MECHANISM ASSEMBLY

SECTION 3
ADJUSTMENT

3.1 Before adjustment

3.1.1 Precaution

- **The adjustments of this unit include the mechanism compatibility and electrical adjustments. During the performance of this work, be sure to observe the precautions for each type of adjustment.**
- **If there is a reference to a signal input method in the signal column of the adjustment chart, "Ext. S-input" means the Y/C separated video signal and "Ext. input" means the composite video signal input.**
- **Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.**

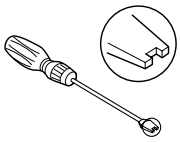
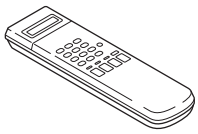
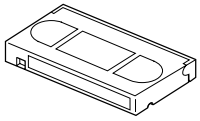
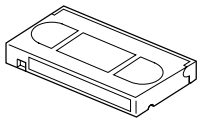
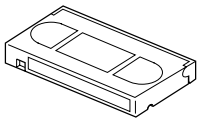
3.1.2 Required test equipments

- Color (colour) television or monitor
- Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- Signal generator: RF / IF sweep / marker
- Signal generator: stairstep, color (colour) bar [NTSC]
- Recording tape
- Digit-key remote controller(provided)

3.1.3 Required adjustment tools

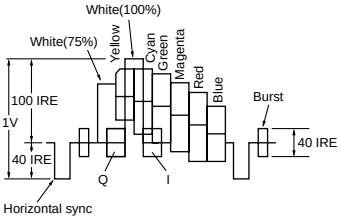
O : Used — : Not used

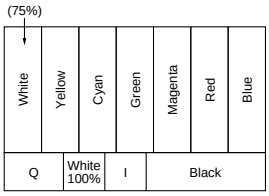
	Mechanism compatibility adjustment	Electrical adjustment
Roller driver	O	–
Jig RCU	–	O
Back tension cassette gauge	O	–
Alignment tape(MHP)	O	–
Alignment tape(MHP-L)	O	O

Roller driver PTU94002	Jig RCU PTU94023B	Back tension cassette gauge PUJ48076-2
		
Alignment tape (SP, stairstep, NTSC) MHP	**Alignment tape (EP, stairstep, NTSC) MHP-L**	
		

3.1.4 Color (colour) bar signal, color (colour) bar pattern

• Color(colour) bar signal [NTSC] **• Color(colour) bar pattern [NTSC]**





3.1.5 Switch settings

When adjusting this unit, set the VCR mode and switches as described below.

- When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See "section 1 disassembly".)

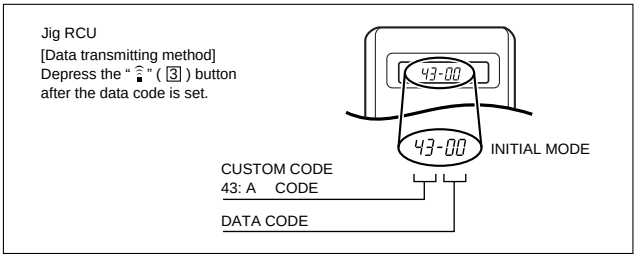


Fig. 3-1-5a Jig RCU [PTU94023B]

- Set the switches as shown below unless otherwise specified on the relevant adjustment chart. The switches that are not listed below can be set as desired.
  If the VCR is not equipped with the functions detailed below, setup is not required.

AUTO PICTURE/VIDEO CALIBRATION/ B.E.S.T./D.S.P.C.	OFF
PICTURE CONTROL/SMART PICTURE	NORMAL/NATURAL
VIDEO STABILIZER	OFF
TBC	ON
Digital 3R	ON
VIDEO NAVIGATION/TAPE MANAGER	OFF
BLUE BACK	OFF

3.1.6 Manual tracking mode (Auto tracking ON/OFF) setting

(1) In order to set to the manual tracking mode during tape playback, press the “SP/EP(LP)” button on the remote control unit.
  • Each press of the button switches the auto tracking ON or OFF.
  • When the auto tracking is OFF, the monitor screen displays “AT: OFF”.
  • When the manual tracking mode is set, the tracking is placed at the center position.
(2) Press “channel +/-” to adjust the tracking manually.

3.1.7 EVR adjustment

Some of the adjustments require the adjustment performed by the EVR system. The main unit have EEPROMs for storing the EVR adjustment data and user setups.

Notes:

- ***In the EVR adjustment mode, the value is varied with the channel buttons (+, –). The adjusted data is stored when the setting mode changes (from PB to STOP, when the tape speed is changed, etc.). Take care to identify the current mode of each adjustment item when making an adjustment.***
- ***When changing the address setting in the EVR adjustment mode, use the Jig RCU or the remote controller having numeric keypad with which a numeric code can be directly input.***
  The remote control code of the Jig RCU corresponds to each of the digit keys on the remote controller as follows.

Digit-key	0	1	2	3	4	5	6	7	8	9
Code	20	21	22	23	24	25	26	27	28	29

- ***As the counter indication and remaining tape indication are not displayed FDP during the EVR adjustment mode, check them on the TV monitor screen.***
- ***When performing the EVR adjustment, confirm that the FDP indication is changed to the EVR mode, as shown below.***

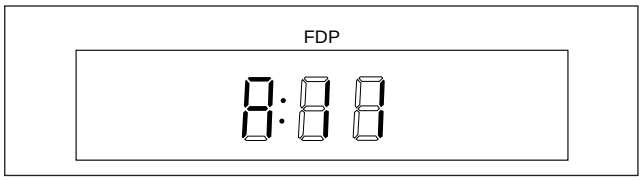


Fig. 3-1-7a EVR mode

3.2 Mechanism compatibility adjustment

Notes:

- ***Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the A/C head, drum assembly or any part of the tape transport system.***
- ***To prevent damaging the alignment tape in the compatibility adjustment, prepare a cassette tape (for self-recording/playback), perform a test on it by transporting it and making sure that the tape is not bent by the tape transport mechanisms such as in the guide rollers.(See Fig.3-2-2a.)***

3.2.1 Tension pole position

Notes:

- ***This adjustment must be performed every time the tension band is replaced.***

Signal	(A)	• Back tension cassette gauge [PUJ48076-2]
Mode	(B1)	• PB
	(B2)	• Eject end
Adjustment part	(F)	• Adjust pin [Mechansim assembly]
Specified value	(G)	• 25 - 51 gf•cm (2.45 – 5 × 10^{-3} Nm)

(1) Play back the back tension cassette gauge (A).
(2) Check that the indicated value on the left side gauge is within the specified value (G).
(3) If the indicated value is not within the specified value (G), perform the adjustment in a following procedure.(See Fig.3-2-1a.)
  1) Remove the top frame, cassette holder and side frames (L/R) all together. (See “section 2 mechanism”.)
  2) Rotate the loading motor gear to move the control plate so that the triangular stamping to the left of the “P” stamping is aligned with the stamping (a) on the main deck. This positioning is mode (B1).
  3) Adjust by turning the adjustment pin so that the tip of the tension arm is aligned with the stamping (b) on the main deck.
  4) Rotate the reel disk (S) by about one turn clockwise and make sure that the round hole of the adjustment pin is located in the “OK” range.
  If it is outside this range, restart the adjustment from the beginning.
  After completion of the adjustment, rotate the loading gear motor to return it to the mode (B2) position.

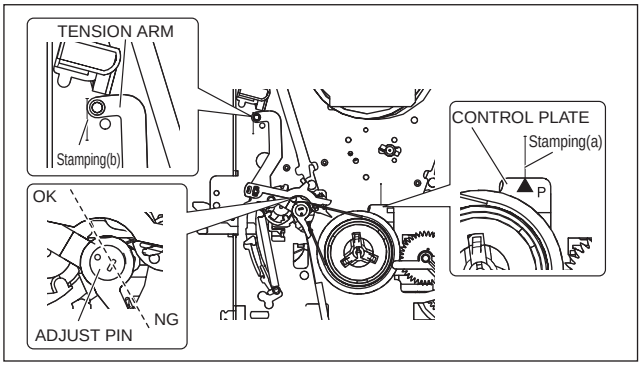


Fig. 3-2-1a

3.2.2 FM waveform linearity

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, NTSC) [MHP] • Alignment tape(EP, stairstep, NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Guide roller [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Make sure that there is no significant level drop of the V.PB FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig. 3-2-2b.)
(5) Reduce the V.PB FM waveform by the tracking operation. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver to make the V.PB FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the roller driver to make it linear. (See Fig. 3-2-2b.)
(6) Make sure that the V.PB FM waveform varies in parallel and linearly with the tracking operation again. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play back the alignment tape (A1) again and confirm the V.PB FM waveform.
(8) After adjustment, confirm that the tape wrinkling does not occur at the roller upper or lower limits. (See Fig. 3-2-2a.)

[Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]

(9) Repeat steps (1) to (8) by using the alignment tape (A2).

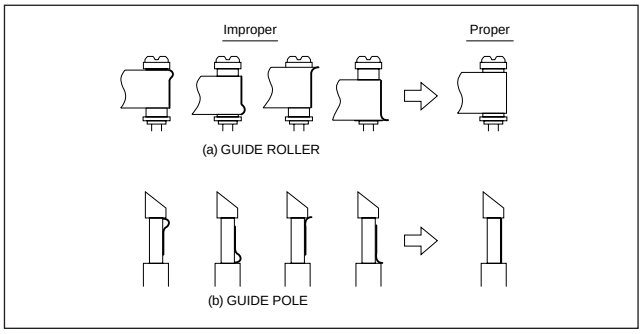


Fig. 3-2-2a

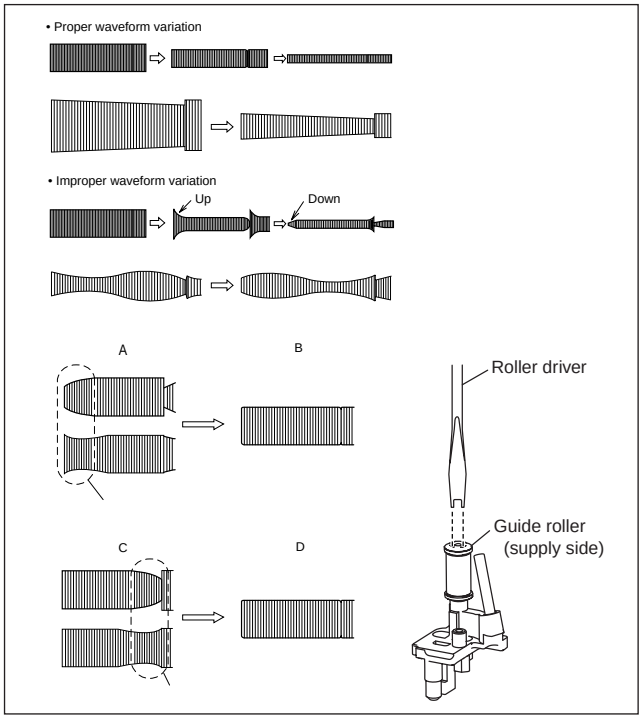


Fig. 3-2-2b

3.2.3 Height and tilt of the A/C head

Note:

• Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See "section 2 mechanism".)

Signal	(A)	• Alignment tape(SP, stairstep, NTSC) [MHP]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• AUDIO OUT terminal • TP4001 (CTL. P)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head [Mechanism assembly]
Specified value	(G)	• Maximum waveform

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the AUDIO OUT waveform and Control pulse waveform at the measuring points (D1) and (D2) in the ALT mode.
(3) Set the VCR to the manual tracking mode.
(4) Adjust the AUDIO OUT waveform and Control pulse waveform by turning the screws (1), (2) and (3) little by little until both waveforms reach maximum. The screw (1) and (3) are for adjustment of tilt and the screw (2) for azimuth.

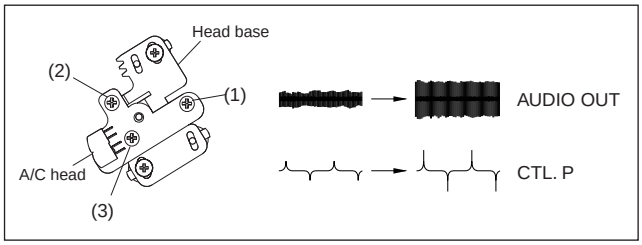


Fig. 3-2-3a

3.2.4 A/C head phase (X-value)

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, NTSC) [MHP] • Alignment tape(EP, stairstep, NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head base [Mechanism assembly]
Specified value	(G)	• Maximum V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Loosen the screws (4) and (5), then set the Roller driver to the innermost projected part of the A/C head. (See Fig. 3-2-4a.)
(5) Rotate the roller driver so that the A/C head comes closest to the capstan. From there, move the A/C head back gradually toward the drum until the point where the FM waveform is maximized for the second time, and then tighten the screws (4) and (5) temporarily.
(6) Play an alignment tape (A2) and set to the manual-tracking mode.
(7) Fine-adjust A/C head base position to maximize the FM waveform, and then tighten the screws (4) and (5) firmly.
(8) Play alignment tapes (A1) and (A2) and confirm that the FM waveforms are maximized when the tracking is at the center position.

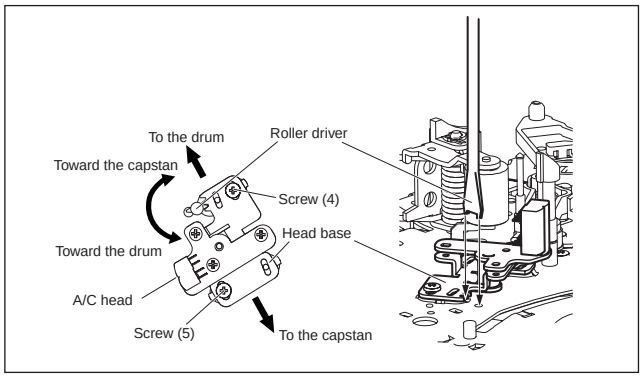


Fig. 3-2-4a

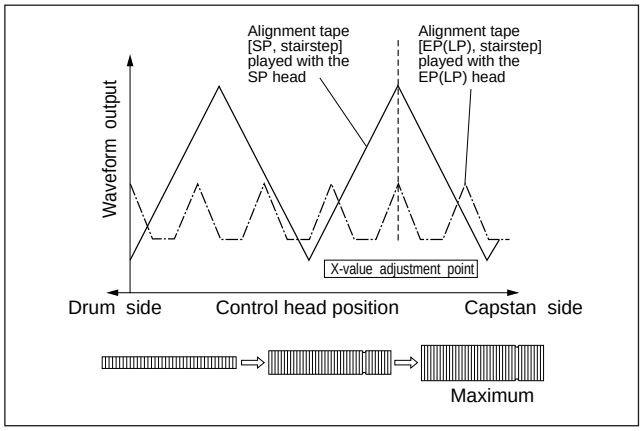


Fig. 3-2-4b

3.3 Electrical adjustment

Note:
The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.
In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

3.3.1 Servo circuit

3.3.1.1 Switching point

Signal	(A1) (A2)	• Stairstep signal • Alignment tape (EP,stairstep,NTSC) [MHP-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• VIDEO OUT terminal (75Ω terminated) • TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Jig RCU: Code “5A”
Specified value	(G)	• 7.5 ± 0.5H
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Play back the signal (A1) of the alignment tape (A2).
(2) Apply the external trigger signal to D.FF (E) to observe the VIDEO OUT waveform and V.PB FM waveform at the measuring points (D1) and (D2).
(3) Set the VCR to the manual tracking mode.
(4) Adjust tracking so that the V.PB FM waveform becomes maximum.
(5) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(6) If the VCR enters the eject mode, repeat steps (1) to (5) again.
(7) Play back the alignment tape (A2) again, confirm that the switching point is the specified value (G).

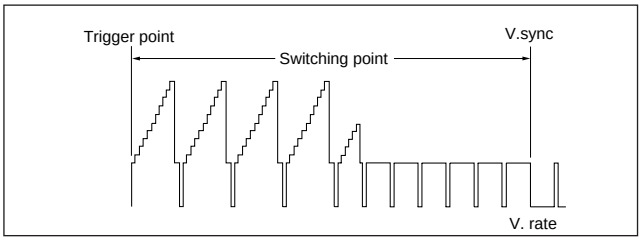


Fig. 3-3-1-1a Switching point

3.3.1.2 Slow tracking preset

Signal	(A1) (A2)	• Ext. input • Color (colour) bar signal [NTSC]
Mode	(B1) (B2)	• S-VHS SP • S-VHS EP
Measuring point	(D)	• TV-Monitor
Adjustment part	(F)	• Jig RCU: Code “71“ or “72”
Specified value	(G)	• minimum noise
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Record the signal (A2) in the mode (B1), and play back the recorded signal.
(2) Set the VCR to the manual tracking mode.
(3) Set the VCR to the FWD slow (+1/6x) mode.
(4) Transmit the code (F) from the Jig RCU to adjust so that the noise bar becomes the specified value (G) on the TV monitor in the slow mode.
(5) Set the VCR to the Stop mode.
(6) Confirm that the noise bar is (G) on the TV monitor in the slow mode.
(7) Repeat steps (3) to (6) in the REV slow (–1/6x) mode.
(8) Repeat steps (1) to (7) in the mode (B2).

Note:

- **For FWD slow (+1/6x) playback, transmit the code "08" from the Jig RCU to enter the slow playback mode, and transmit the code "D0" for REV slow (–1/6x) mode.**

3.3.2 Video circuit

3.3.2.1 EE Y/PB Y (S-VHS/VHS) level

Signal	(A1) (A2) (A3)	• Ext. S-input • Ext. input • Color (colour) bar signal [NTSC]
Mode	(B1) (B2) (B3)	• EE SP • S-VHS SP • VHS SP
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• VIDEO OUT terminal (75Ω terminated)
EVR mode EVR address	(F1) (F2) (F3) (F4)	• Jig code "57" • A : 11 • Jig code "21" twice • Jig code "18" or "19" (Channel +/-)
Specified value	(G)	• 1.00 ± 0.05 Vp-p
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Input the signal (A3) from the input point (A1).
(2) Set the VCR to the mode (B1).
(3) Observe the VIDEO OUT waveform at the measuring point (D).
(4) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(5) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(6) Transmit the code (F4) from the Jig RCU to adjust so that the Y level of the VIDEO OUT waveform becomes the specified value (G).
(7) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)
(8) Input the signal (A3) from the input point (A2).
(9) Repeat steps (3) to (7) in the mode (B1).
(10) Record the signal (A3) in the mode (B2), and play back the recorded signal.
(11) Set the VCR to the manual tracking mode.
(12) Repeat steps (3) to (7) in the mode (B2).
(13) Record the signal (A3) in the mode (B3), and play back the recorded signal.
(14) Set the VCR to the manual tracking mode.
(15) Repeat steps (3) to (7) in the mode (B3).

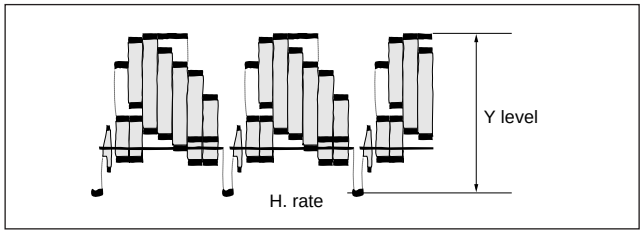


Fig. 3-3-2-1a EE/PB Y level

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SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

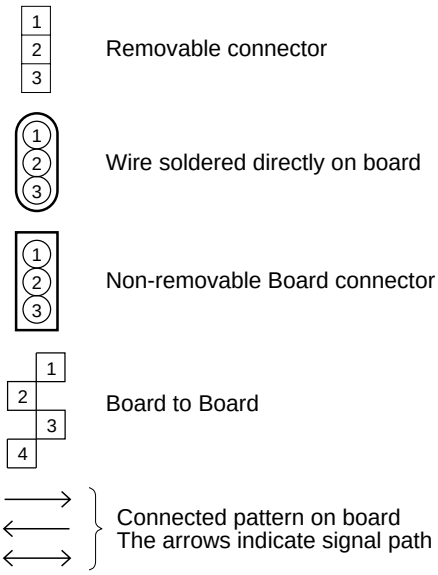
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K or k: kΩ (1000Ω), M: MΩ (1000kΩ)
2) All capacitance values are in µF, (P: PF).
3) All inductance values are in µH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

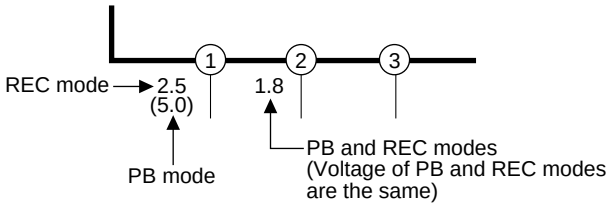
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications



4. Voltage measurement

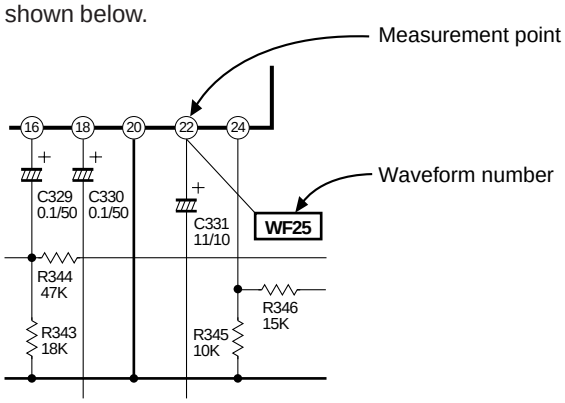
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



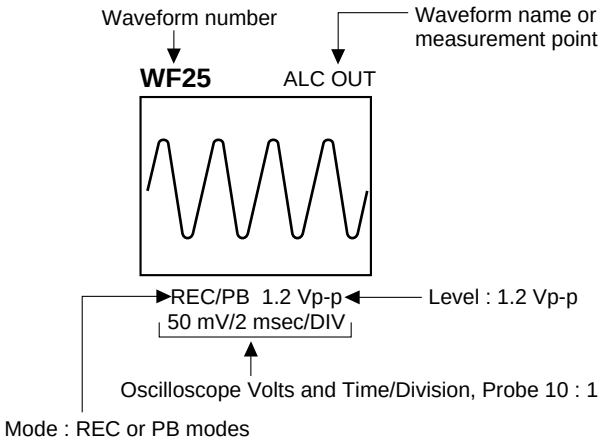
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.

Playback signal path

Playback and recording signal path

Recording signal path
(including E-E signal path)

Capstan servo path

Drum servo path

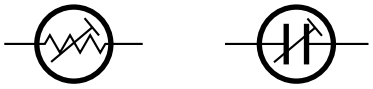
(Example)

R-Y Playback R-Y signal path

Y Recording Y signal path

7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

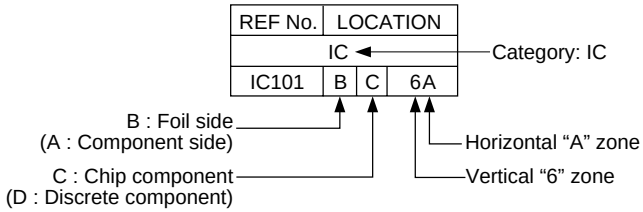
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

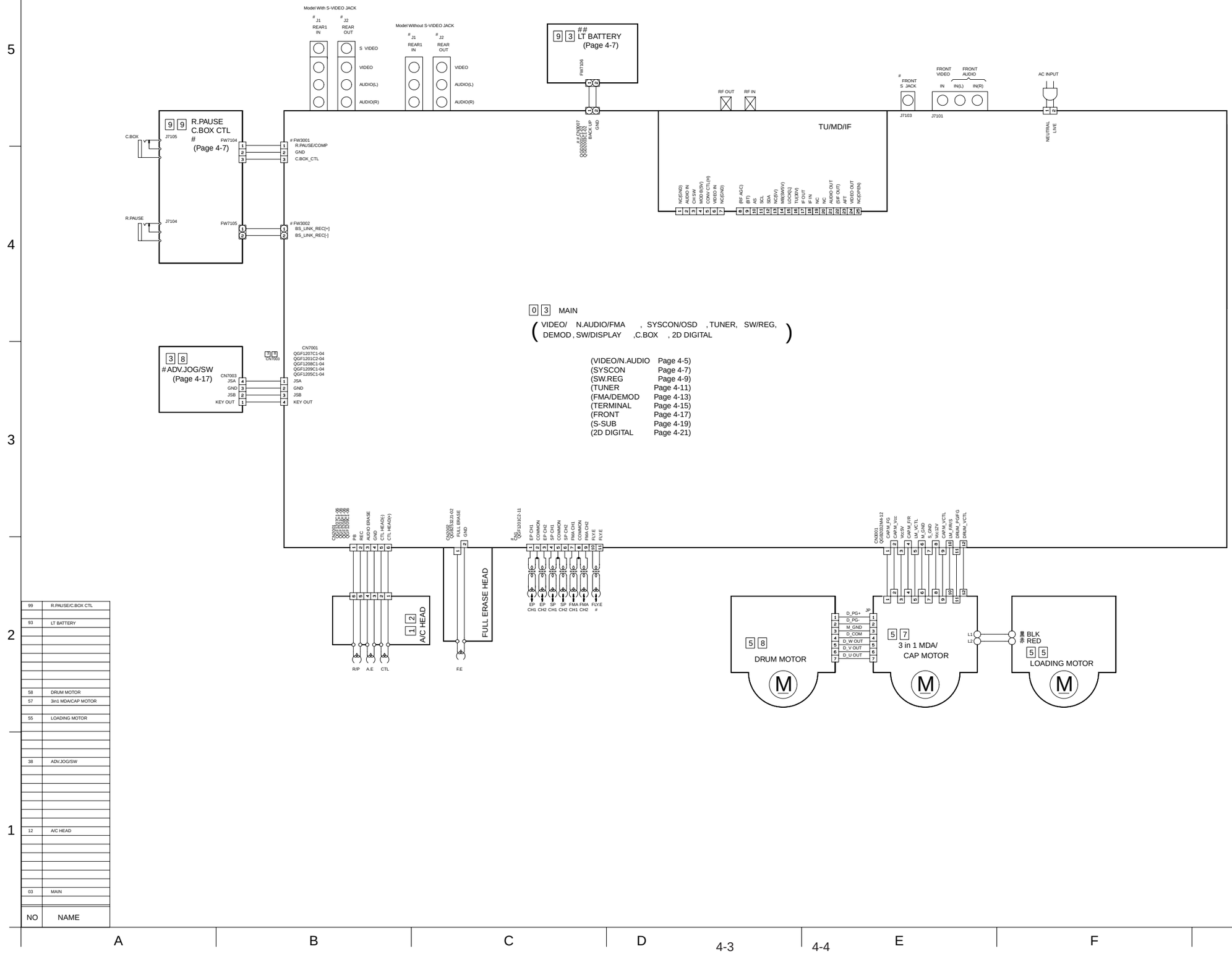
Parts location are indicated by guide scale on the circuit board.



Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS

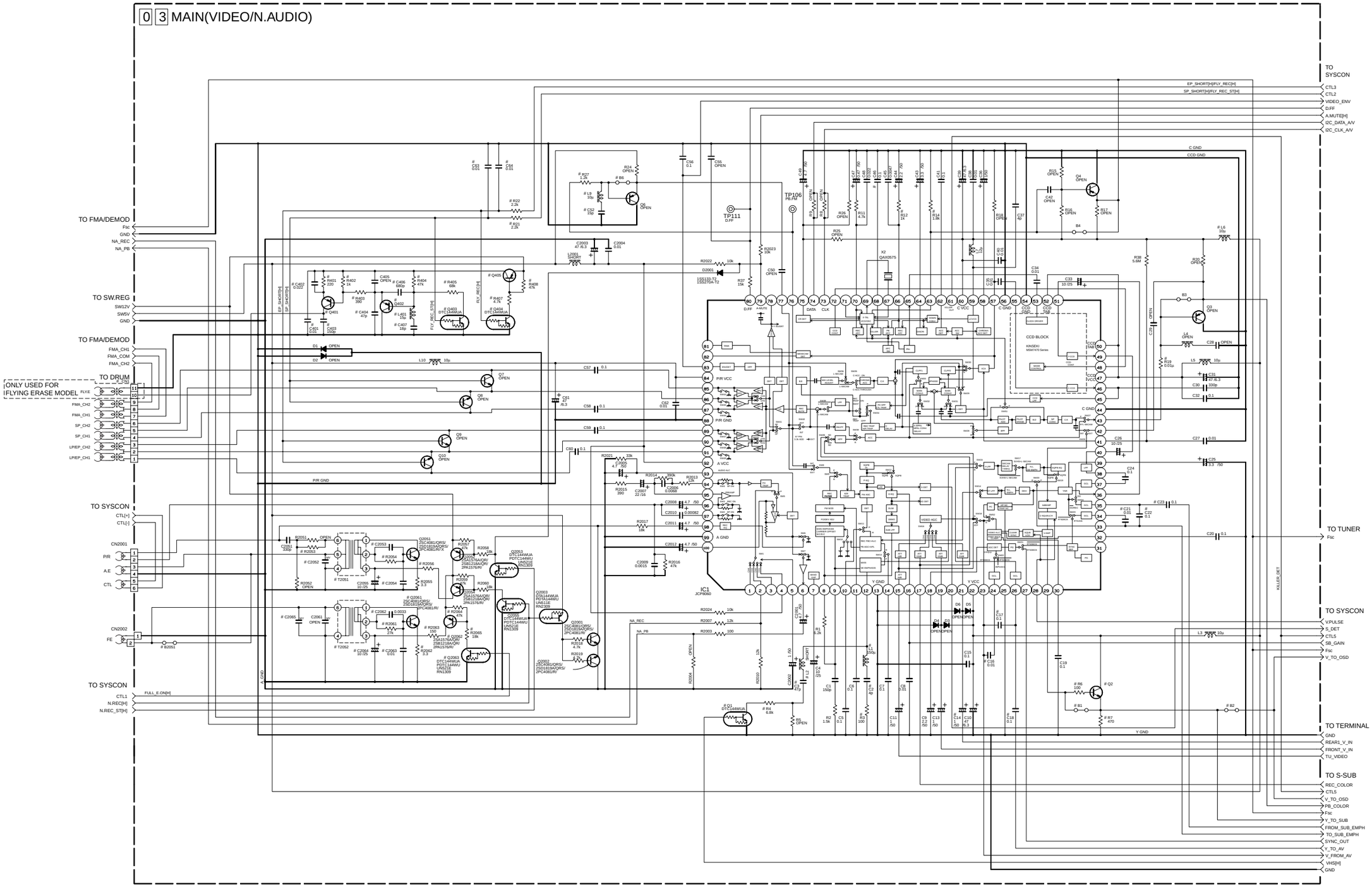


NO	NAME
99	R.PAUSE/C.BOX CTL
93	LT BATTERY
58	DRUM MOTOR
57	3in1 MDA/CAP MOTOR
55	LOADING MOTOR
38	ADV.JOG/SW
12	A/C HEAD
03	MAIN

p10468001a_rev0.1

4.2 MAIN (VIDEO/N.AUDIO) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



VIDEO ○ : USED × : NOT USED

#DIFFERENCE TABLE 1

	IC1	B1, Q1, R4, R14, C3, C16 C18, C21, C23, L2	B2, Q2, R6 R7, C17, C22	B2, R27 C52, L9	R3	R19	C2	C46	L1	L6
SVHS	NSA	○	×	○	100	○	4p	0.1	150	100
VHS	NVA	×	○	×	8.2k	×	33p	0.033	SHORT	SHORT

#DIFFERENCE TABLE 2

FLYING ERASE	Q401-Q405 R401-R405 R408	L401 R407 C401-C407	CN1	R21, R22 C53, C54
YES	○		1-11 PIN	○
NO	×		1-9 PIN	×

#DIFFERENCE TABLE 3

REAR1_V_IN	C14
YES	○
NO	×

AUDIO

#DIFFERENCE TABLE 4

MODEL	T2051	T2052	B2051	Q2061-Q2063 R2061-R2065 C2062-C2064	C2052	R2053	R2054	R2056	C2053	C2054	C2065
with A.DUBBING	PELN0860, QQR1082-001, QQR1310-001	PELN0861, QQR1083-001, QQR1311-001	×	○	0.033	3.9k	15k	100	0.0033	0.01	0.033
w/o A.DUBBING	PELN0832, PELN0954, QQR0002-001, QQR1309-001	×	○	×	×	3.3k	12k	82	0.0047	0.022	0.082

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

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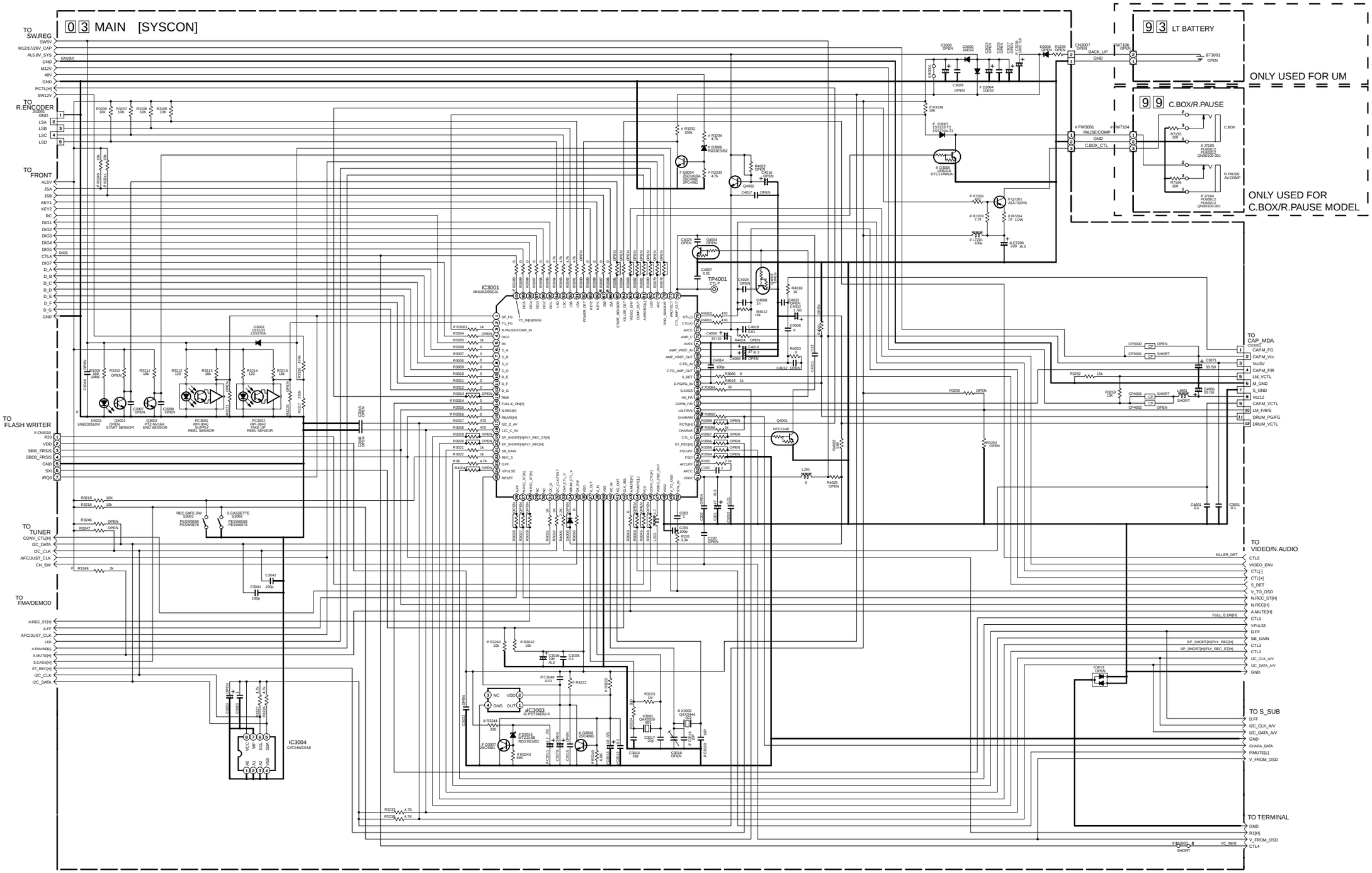
4.3 MAIN (SYSCON) AND C.BOX/R.PAUSE SCHEMATIC DIAGRAMS

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



O: USED
X: NOT USED

#DIFFERENT TABLE 1

	BEFORE AP	AFTER AP	
	CN3010,R3016 R3248	R3016	CN3010,R3248
HR-S2902US HR-J7010UM HR-S8010UM	O	X	X
HR-S3902US HR-S5902US	O	O	X

#DIFFERENT TABLE 2

Features	SYMBOL	HR-S2902US	HR-S3902US	HR-S5902US
ADV JOG	R3206 R3087 R3240 R3241	X	O	O
Audio Full Erase	R3014	X	X	O
CABLE BOX/ R.PAUSE/ COMP LINK	D3007 R3003 R3236 Q3002 Q7201 R7202 R7203 R7204 L7201 C7206 FW3001 FW7104	X	O	O
Rear AV Input Jack	R3016 R3100 B3003	X	O	O

#DIFFERENT TABLE 3

Features		HR-S2902US	HR-S2912UC	HR-S2915UC	HR-S3912UC	HR-S5912UC	HR-J6010UM HR-J7010UM	HR-S8010UM
Rear AV Input Jack	R3016 R3100	X	X	X	O	O	X	X
S-VHS	R3058 R3060 R3064	O	O	O	O	O	X	O

#DIFFERENT TABLE 4

	B3001	C3039 D3004	IC3003,C3012,C3013 C3022 C3048 R3042	Q3006,Q3007,C3016 R3243-R3245 C3011	R3220	R3222	R3232,R3233,R3234 Q3004,D3006,R3095	X3002 C3019 C3020
WITHOUT BACKUP (US & UC)	O	X	X	O	5.6k	470	X	X
WITH BACKUP (UM only)	X	O	O	X	6.8k	4.7k	O	O

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

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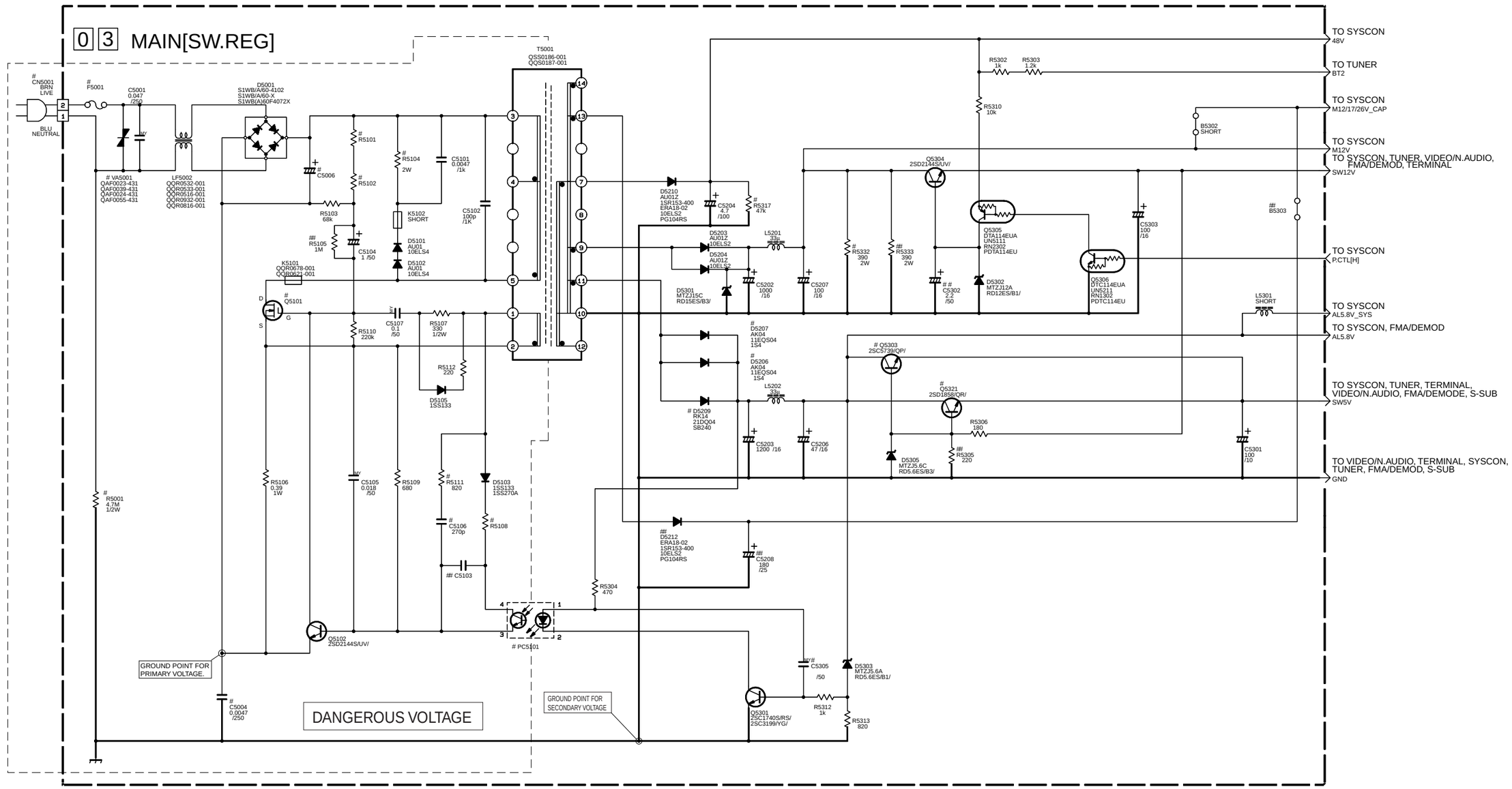
4.4 MAIN (SW.REG) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



##MARK ELEMENTS ARE NOT MOUNTED

#DIFFERENCE TABLE 1 ○ : USED × : NOT USED

FUNCTION / PART NO. / MODEL	CURRENT CAPABILITY		
	C5006	Q5303	Q5321
VHS	47/200	×	○
S-VHS	82/200	○	×

#DIFFERENCE TABLE 2

FUNCTION / PART NO. / MODEL	POWER/VOLTAGE RATING				SAFETY RULE		POWER SAVE		STABILITY					LINE DUMP	CURRENT CAPABILITY		
	Q5101	C5006	PC5101	F5001	R5001	C5004	R5101,R5102	R5104	R5108	R5111	R5317,R5332	C5106	C5305	VA5001	HEAT SINK	CN5001	POWER CORD
US, UC	2SK2043-CB14 2SK2043	REFER TO TABLE 1	PC817X PS2501-1 ON3131/RS/ LTV-817M/BC/ PC817	QMF51N2-1R25J1 QMF51N2-1R25-J5 QMF51N2-1R25J7	○	0.047	330K	150K/2W	1.2K	×	×	×	0.1	○	×	×	QMPD34C-165-K QMPD350-165-E3 QMP03C0-165-JC
UM (D1, SO)	2SK2632 2SK2632-CB14 2SK2129 2SK2129-LT	68/400	PS2561L1-1/L/ PC123FY2 ON3171/R/	QMF51E2-2R0 QMF51E2-2R0J1 QMF51W2-2R0-J8	×	0.022	220K	68K/2W	1.5K	○	○	○	0.27	×	○	○	QMP73JC-17C QMP73JC-17CJ5 QMPR040-170-JC

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
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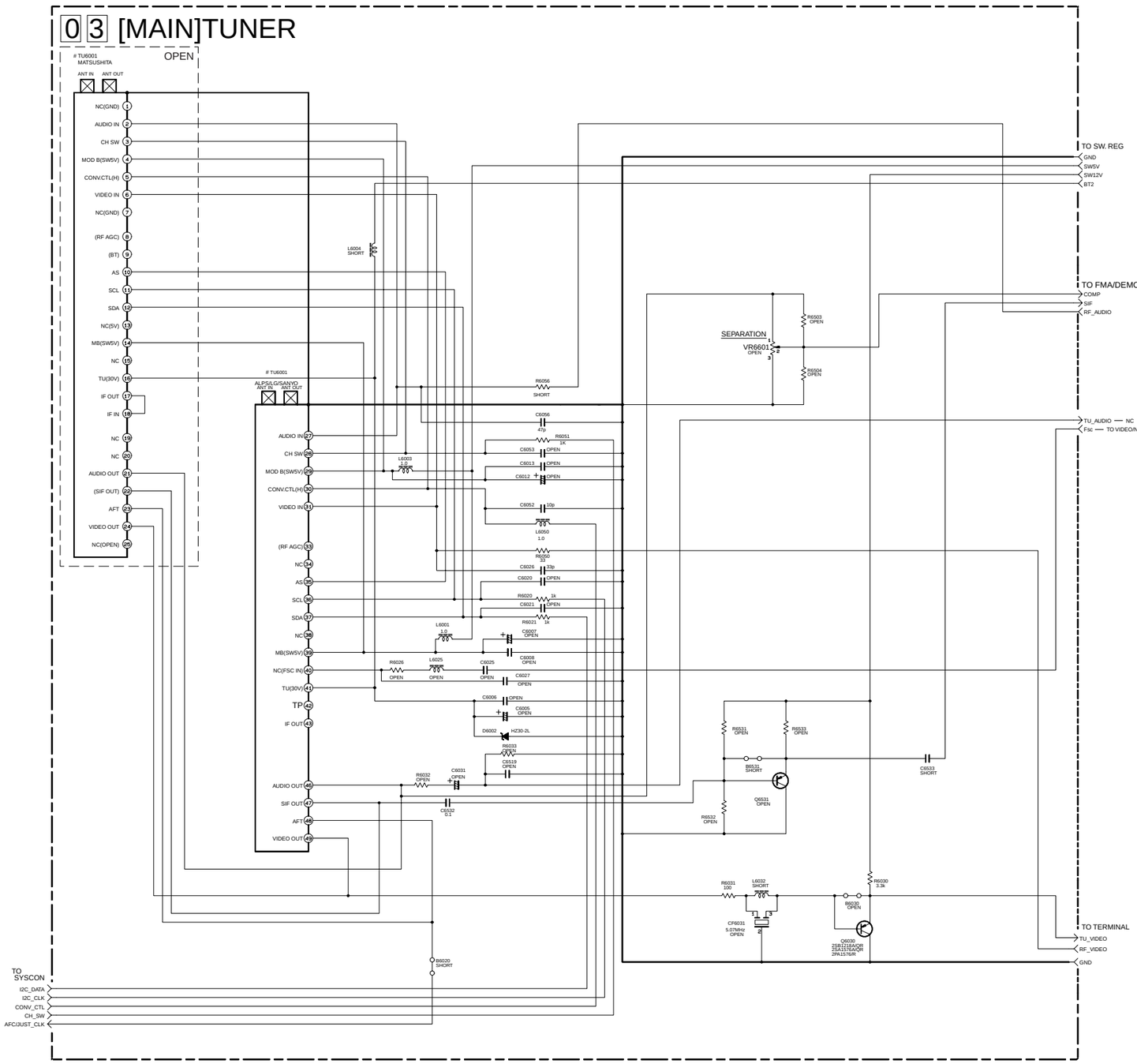
NON POLAR

p20294001a_rev0

4.5 MAIN (TUNER) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

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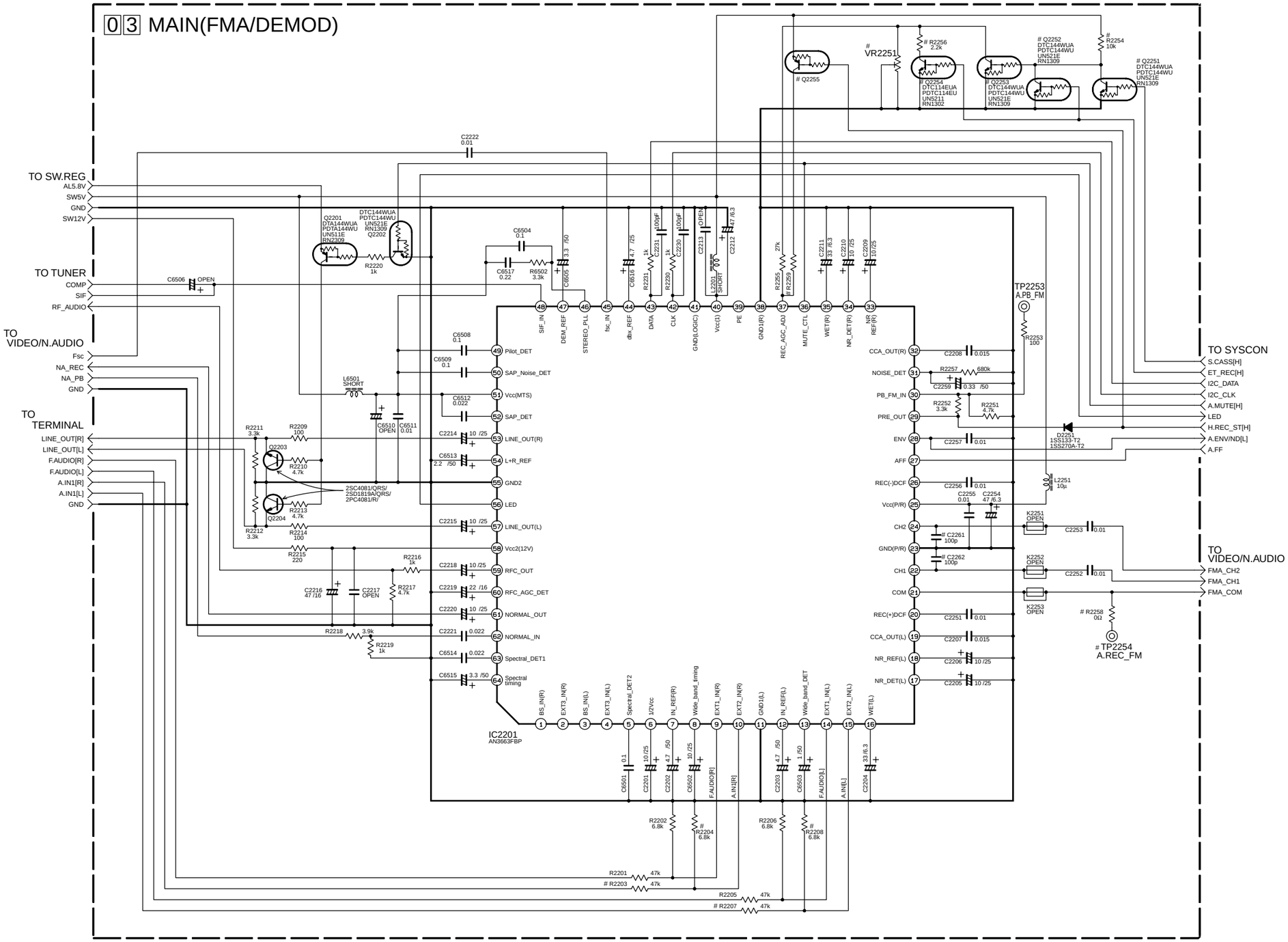
NON POLAR

p10462001a_rev0

4.6 MAIN (FMA/DEMOD) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



#DIFFERENCE TABLE 1

REAR1 INPUT	R2203 R2204 R2207 R2208
YES	×
NO	○

○ : USED × : NOT USED

#DIFFERENCE TABLE 2

S-VHS	FM REC LEVEL ADJ. Q2251-Q2254 R2254,R2256 R2258,TP2254	VR2251	Q2255 R2259
YES	○	10k	×
NO	×	SHORT	×

#DIFFERENCE TABLE 3

FLYING ERASE	C2261,C2262
YES	○
NO	×

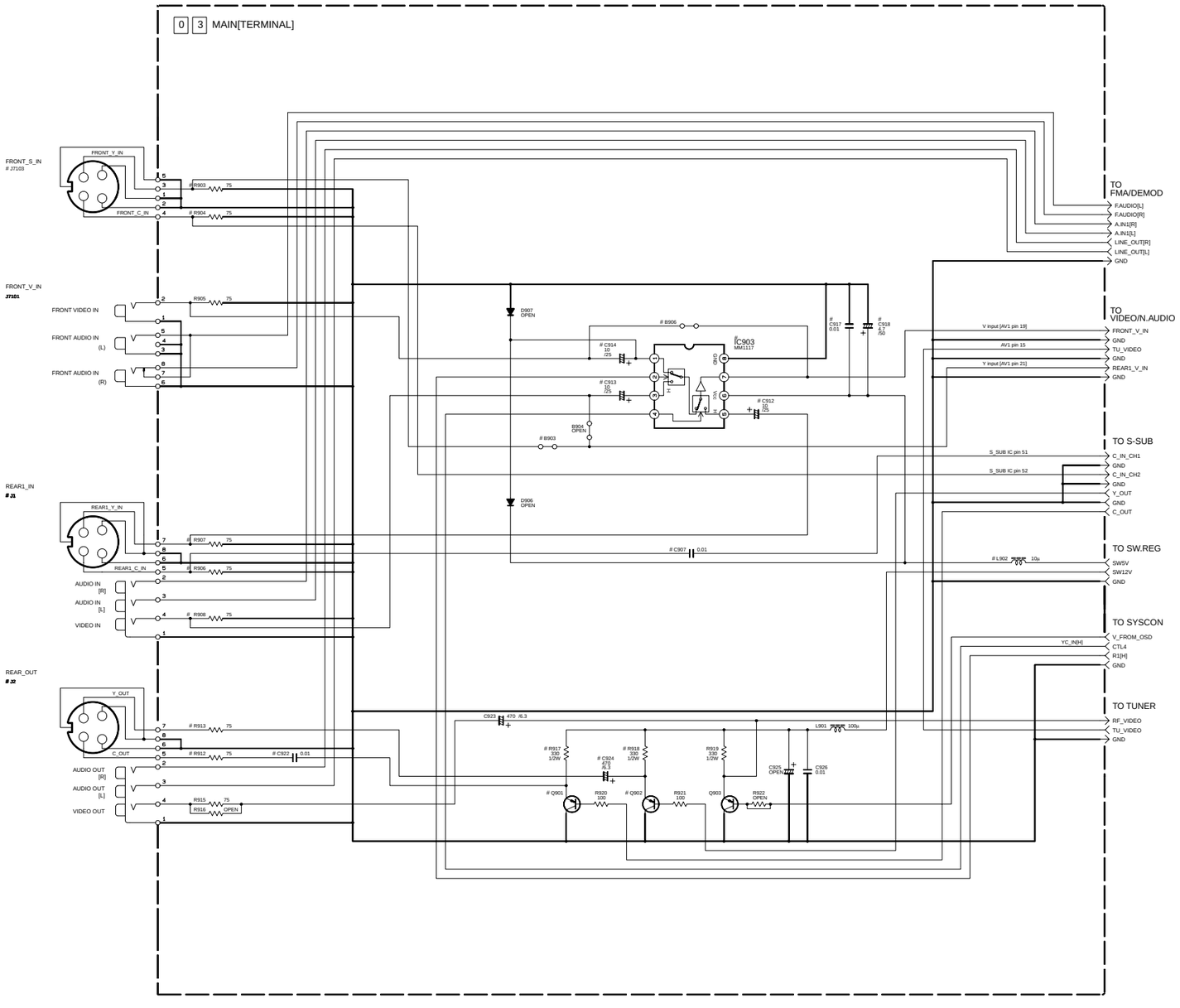
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p20291001a_rev1

4.7 MAIN (TERMINAL) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



○ : USED
× : NOT USED

#DIFFERENCE TABLE 1

INPUT/OUTPUT JACK	J7103	J1	J2
D1	×	×	QNN0286-002 QNN0495-002
S0	QND0106-001	×	QNN0530-001
S1, S15	QND0106-001	QNN0530-001	QNN0530-001

#DIFFERENCE TABLE 2

INPUT/OUTPUT	FRONT_S_IN	REAR1_V_IN	REAR1_S_IN	REAR_S_OUT
	R903 R904	R908	R906 R907 C912	R912 R913 R917 R918 R920 C922 C922 C924 Q901 Q902
D1	×	×	×	×
S0	×	×	×	○
S1, S15	○	○	○	○

#DIFFERENCE TABLE 3

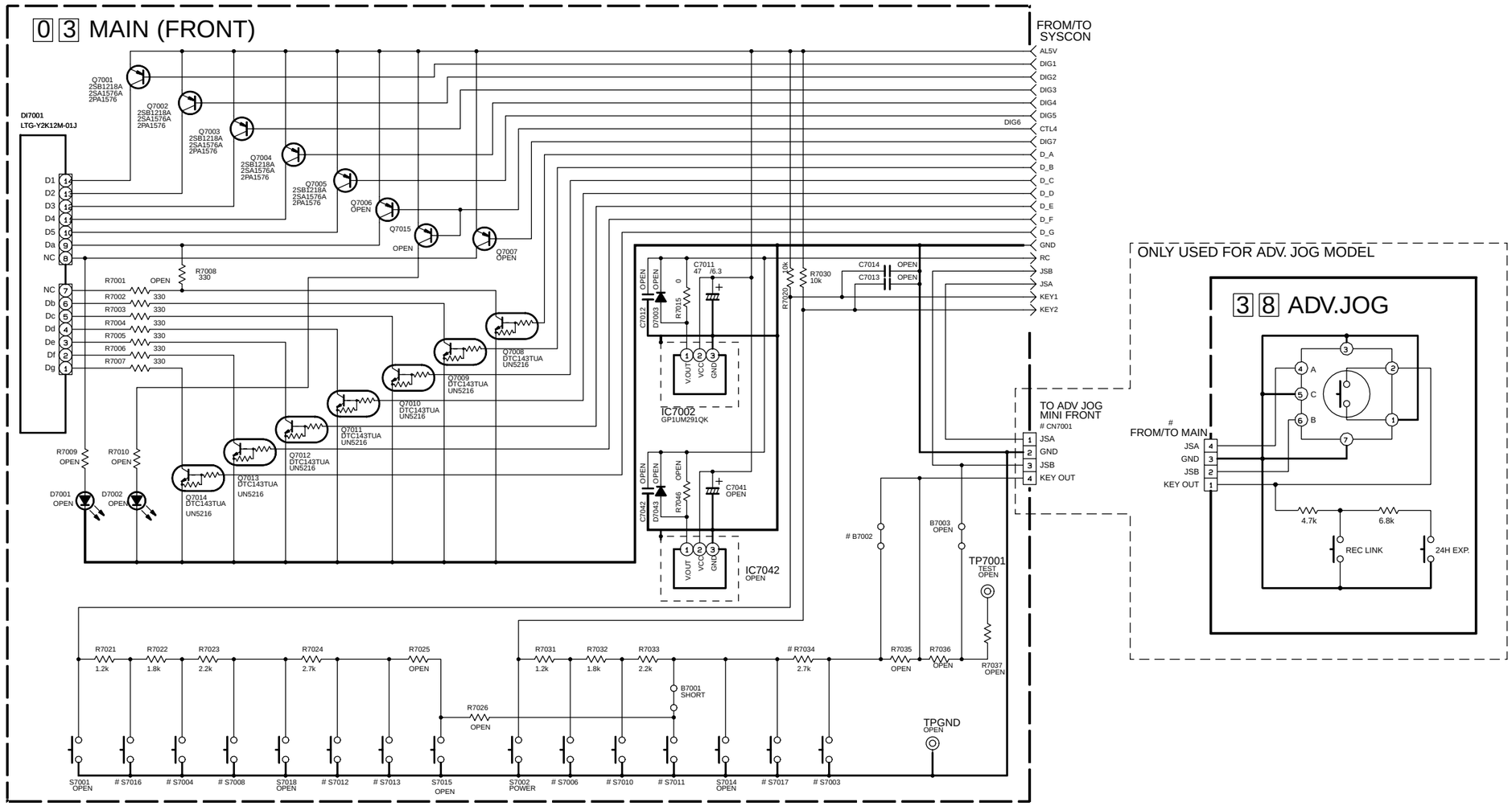
SWITCHING IC	REAR1_C_IN	FRONT_Y_IN	REAR1_V_IN		
	C907	B903	IC903 C913 C914	B906	C917 C918 L902
D1	×	×	×	○	×
S0	×	×	×	○	×
S1, S15	○	○	○	×	○

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p10459001a_rev0

4.8 MAIN (FRONT) AND ADV.JOG SCHEMATIC DIAGRAMS

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



#DIFFERENT TABLE

○ : USED
× : NOT USED

MODEL	S7001	S7002	S7003	S7004	S7006	S7008	S7010	S7011	S7012	S7013	S7014	S7015	S7016	S7017	S7018	R7034 CN7001	B7002	ADV.JOG
692US 2902US 2912UC 2915UC 6010UM 8010UM	-	POWER	-	REW/CH-	FF/CH+	REC	PAUSE/CH	PLAY	-	ST/EJ	-	-	-	-	-	×	×	×
3902US 3912UC	-	POWER	-	DISPLAY	SP/EP	REC	PAUSE	PLAY	-	ST/EJ	-	-	-	-	-	○	○	○
5902US 5912UC	-	POWER	-	INSERT	A.DUB	REC	PAUSE	PLAY	-	ST/EJ	-	-	-	--	-	○	○	○

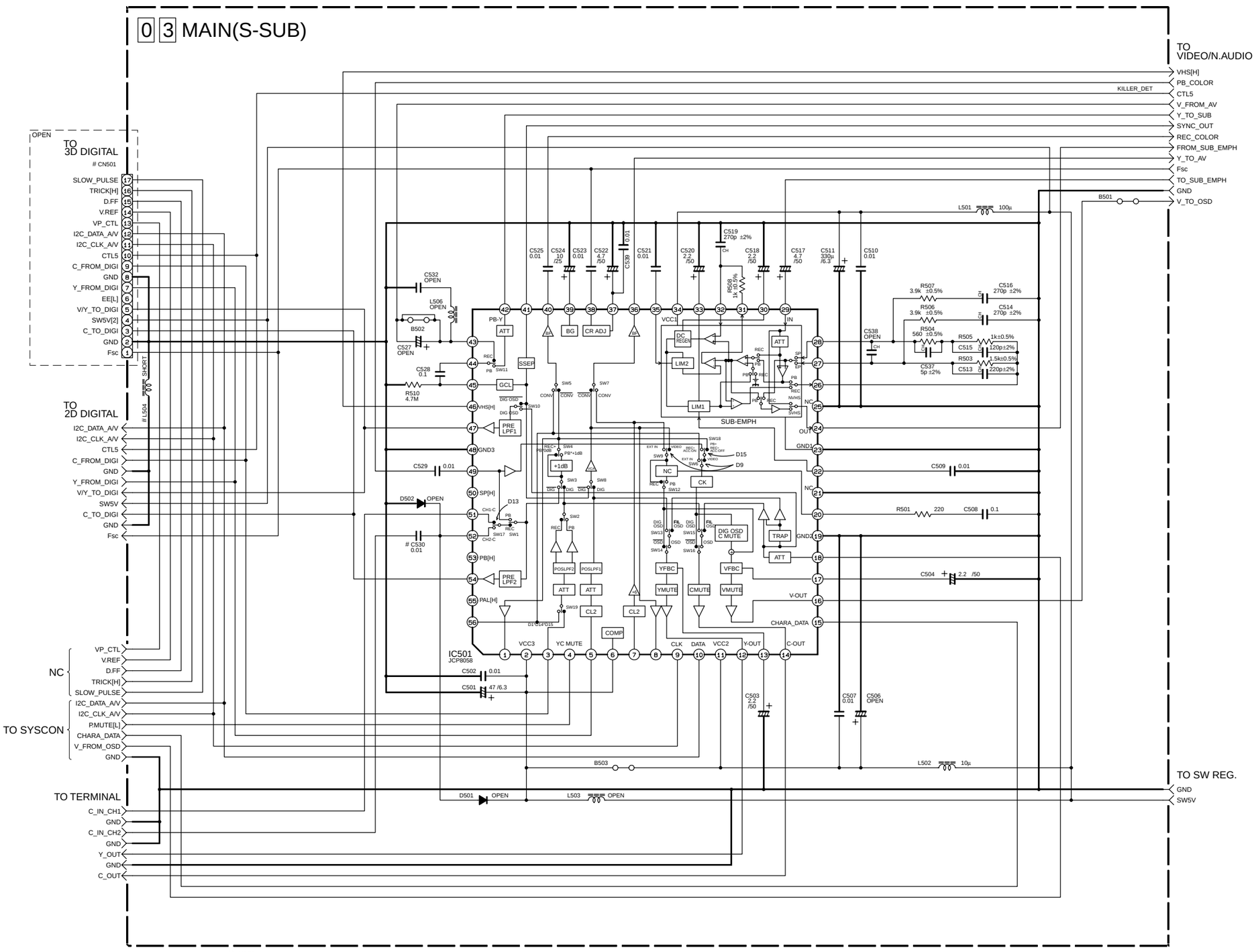
NOTES : UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p20297001a_rev0

4.9 MAIN (S-SUB) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



#DIFFERENCE TABLE 1 (○ : USED, × : NOT USED)

	L504	CN501
2D	○	×
3D	×	○

#DIFFERENCE TABLE 2

MODEL	C530
US, UM, UC (N/US PWB)	○
JP (N/JP PWB)	×

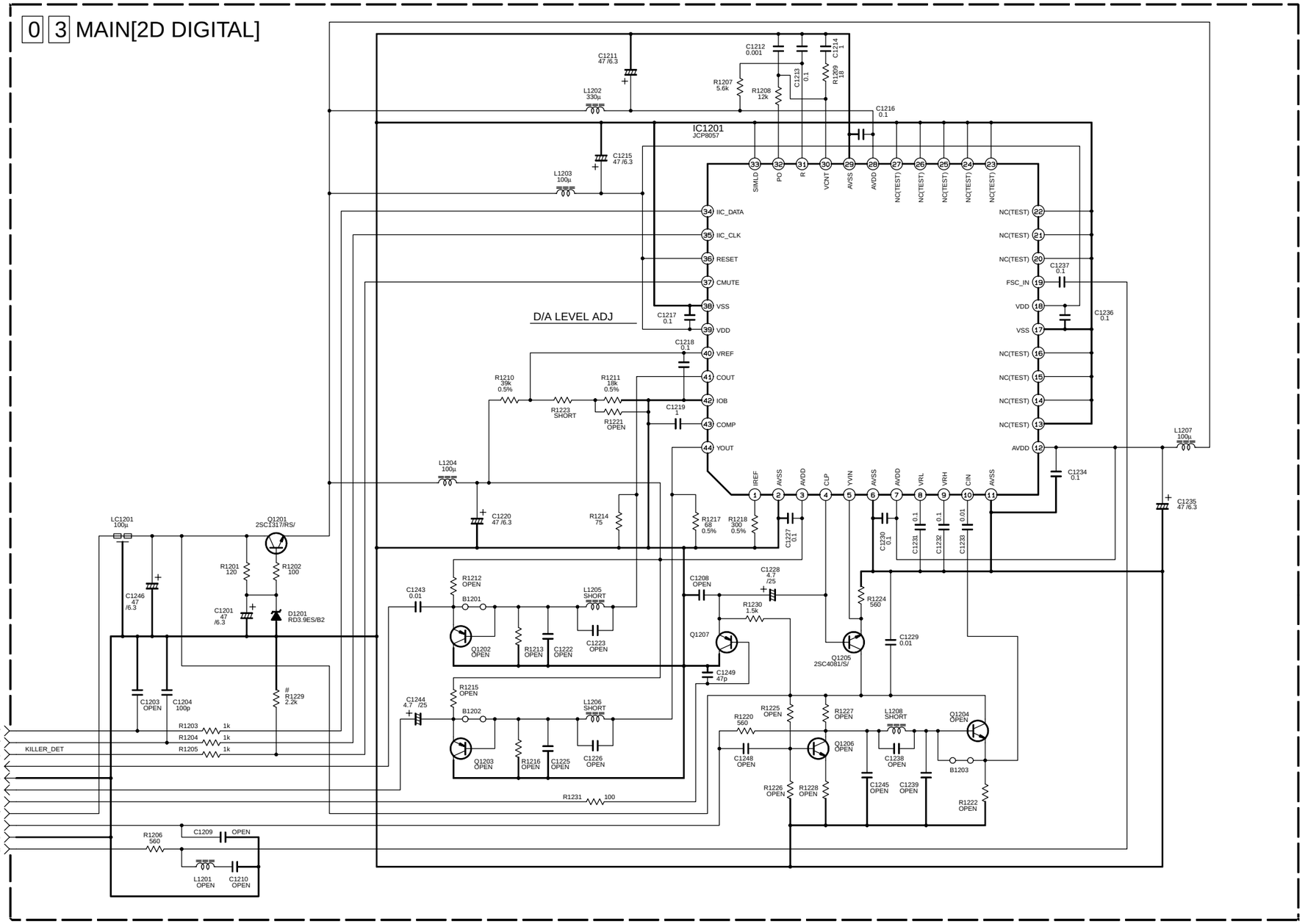
NOTES: UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN µF.

+ ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p20295001a_rev0

4.10 MAIN(2D DIGITAL) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



○ : USED
#DIFFERENCE TABLE 1 × : NOT USED

MODEL	R1229
US, UM, UC	○
JP	×

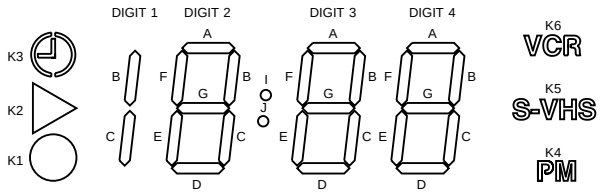
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN µF.

ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p20296001a_rev1

4.11 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT



ANODE CONNECTION

No.	CONNECTION
1	CATHODE 2G, 3G, 4G, I, J
2	CATHODE 2F, 3F, 4F, K6
3	CATHODE 2E, 3E,4E, K1
4	CATHODE 2D, 3D, 4D, K4
5	CATHODE 1C, 2C, 3C, 4C, K5
6	CATHODE 1B, 2B, 3B, 4B, K2
7	CATHODE 2A, 3A, 4A, K3
8	COMMON ANODE K3, K2, K5, K4, K1, K6, I, J
9	COMMON ANODE DIGIT4
10	COMMON ANODE DIGIT3
11	COMMON ANODE DIGIT2
12	COMMON ANODE DIGIT1

4.12 VOLTAGE CHARTS

<MAIN>

MODE PIN NO.	REC	PLAY
IC501		
1	0.3	2.9
2	5.0	5.0
3	2.8	2.8
4	4.9	4.9
5	3.3	3.3
6	5.0	5.0
7	2.7	3.1
8	0.3	2.7
9	3.4	2.8
10	3.9	4.1
11	5.0	5.0
12	2.3	2.3
13	2.3	4.2
14	2.4	2.4
15	0.0	0.0
16	2.3	2.6
17	2.7	2.7
18	2.3	2.0
19	0.0	0.0
20	3.0	2.0
21	0.0	0.0
22	0.0.	0.0
23	0.0	0.0
24	2.3	2.3
25	0.0	0.0
26	2.3	2.4
27	2.3	2.4
28	2.3	2.4
29	2.3	2.4
30	3.6	3.6
31	2.3	2.3
32	2.3	2.3
33	3.4	3.4
34	5.0	5.0
35	0.0	0.1
36	2.4	2.1
37	2.6	2.6
38	2.8	2.8
39	2.8	2.8
40	2.5	0.1
41	1.5	1.5
42	1.9	2.4
43	2.3	2.3
44	2.4	2.6
45	3.0	3.1
46	4.3	4.3
47	2.4	2.4
48	0.0	0.0
49	2.8	2.8
50	4.4	4.4
51	2.8	2.8
52	2.8	2.8
53	0.0	4.4
54	0.8	2.7
55	0.0	0.1
56	2.8	2.8

MODE PIN NO.	REC	PLAY
IC2201		
1	2.4	2.4
2	0.0	0.0
3	2.4	2.4
4	0.0	0.0
5	2.3	2.3
6	2.5	2.5
7	2.0	2.0
8	0.4	0.4
9	0.0	0.0
10	0.0	0.0
11	0.0	0.0
12	2.0	2.0
13	2.2	2.2
14	0.0	0.0
15	0.0	0.0
16	2.5	2.5
17	0.7	0.7
18	2.4	2.4
19	2.5	0.0
20	2.0	0.0
21	1.9	0.0
22	2.0	0.7
23	0.0	0.0
24	2.0	0.7
25	5.0	5.0
26	2.0	0.0
27	0.0	0.0
28	4.3	2.2
29	4.4	1.9
30	4.9	1.0
31	1.1	1.9
32	2.5	2.5
33	2.5	2.5
34	0.7	0.7
35	2.6	2.6
36	0.0	0.0
37	1.6	1.6
38	0.0	0.0
39	0.0	0.0
40	5.0	5.0
41	0.0	.0.
42	5.0	5.0
43	4.9	4.9
44	2.3	2.3
45	0.0	0.0
46	3.6	3.6
47	1.5	1.5
48	2.2	2.2
49	3.5	3.5
50	3.5	0.0
51	0.0	5.0
52	3.5	0.0
53	4.4	0.0
54	2.4	0.0
55	0.0	0.0
56	0.0	0.0

MODE PIN NO.	REC	PLAY
57	4.4	0.0
58	9.3	9.3
59	4.4	4.4
60	0.0	0.0
61	2.5	2.5
62	2.4	0.0
63	2.4	2.4
64	0.5	0.8
IC3001		
1	5.0	5.0
2	5.0	4.9
3	0.0	0.0
4	0.0	0.0
5	4.9	4.9
6	0.9	0.0
7	0.9	4.9
8	0.9	0.0
9	0.0	0.0
10	1.8	0.0
11	0.9	0.9
12	1.8	3.7
13	0.0	0.0
14	0.0	0.0
15	4.9	0.0
16	0.0	0.0
17	3.9	3.7
18	3.3	3.3
19	0.0	0.0
20	4.5	4.8
21	2.3	2.3
22	2.5	4.9
23	2.5	2.4
24	0.0	0.0
25	4.9	4.9
26	0.0	2.4
27	4.9	0.0
28	4.7	0.0
29	0.0	0.0
30	0.0	0.0
31	4.8	4.7
32	4.8	4.7
33	2.7	0.0
34	2.7	2.7
35	4.4	4.4
36	0.0	4.9
37	2.4	2.4
38	2.3	2.3
39	0.0	0.0
40	0.0	0.0
41	0.0	0.0
42	0.0	0.0
43	0.3	0.3
44	4.9	0.0
45	0.0	0.0
46	0.0	4.9
47	2.3	2.4
48	0.0	0.0

MODE PIN NO.	REC	PLAY
49	2.4	2.4
50	2.6	2.6
51	5.1	5.1
52	2.6	2.6
53	2.6	2.6
54	0.0	0.0
55	0.0	0.0
56	0.0	0.0
57	4.8	4.8
58	0.0	0.0
59	4.8	4.8
60	0.0	0.0
61	0.0	2.6
62	0.0	0.0
63	0.0	0.0
64	0.0	0.0
65	1.4	1.4
66	0.0	0.0
67	2.5	2.5
68	2.5	2.5
69	2.5	2.5
70	2.5	2.5
71	0.0	0.0
72	0.0	2.4
73	0.0	4.9
74	2.9	0.0
75	2.0	2.4
76	2.5	2.4
77	4.5	4.5
78	4.9	4.9
79	0.0	0.0
80	0.6	0.5
81	0.7	0.1
82	0.0	0.0
83	0.0	4.1
84	0.0	0.0
85	0.0	0.0
86	0.0	0.0
87	0.0	0.0
88	4.9	4.9
89	4.9	4.9
90	0.0	0.0
91	0.0	0.0
92	4.9	4.9
93	0.0	0.0
94	4.9	4.9
95	3.9	4.0
96	3.9	4.0
97	3.9	4.0
98	3.9	4.0
99	3.9	4.0
100	0.0	0.0

MODE PIN NO.	REC	PLAY
IC3004		
1	0.0	0.0
2	0.0	0.0
3	0.0	0.0
4	0.0	0.0
5	4.9	4.9
6	4.8	4.8
7	0.0	0.0
8	4.9	4.9
CN2001		
1	0.4	0.0
2	0.0	0.0
3	0.2	0.0
4	0.0	2.4
5	2.3	2.4
6	2.5	
CN3001		
1	2.4	2.4
2	12.0	12.0
3	5.1	5.1
4	0.0	0.0
5	7.2	7.2
6	0.0	0.0
7	0.0	0.0
8	12.0	12.0
9	2.7	2.7
10	2.6	2.6
11	1.4	1.4
12	2.6	2.6

COMPONENT PARTS LOCATION GUIDE <MAIN> LPB10187-001C

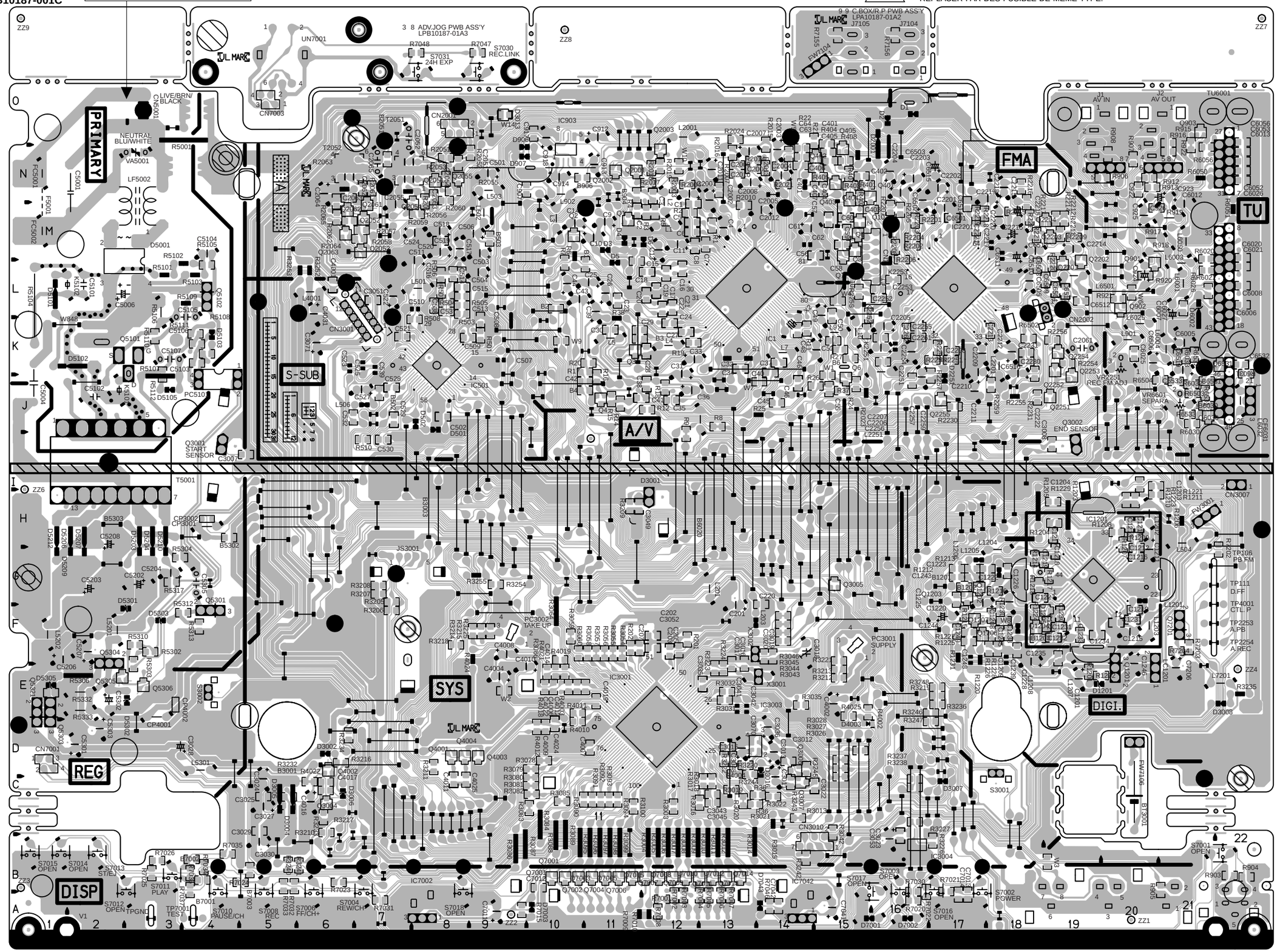
REF.NO.	LOCATION
CAPACITOR	
C1	B C 12M
C2	B C 11M
C3	B C 12N
C4	A D 13M
C5	B C 12M
C6	B C 12M
C7	B C 13M
C8	B C 12M
C9	A D 11M
C10	A D 11M
C11	A D 12M
C13	A D 12M
C14	A D 10M
C15	B C 11L
C16	B C 12L
C17	B C 12L
C18	B C 12L
C19	B C 12L
C20	B C 12L
C21	B C 12L
C22	B C 12L
C23	B C 11L
C24	B C 12K
C25	A D 11L
C26	A D 11L
C27	B C 12K
C28	B C 12K
C29	B C 11K
C30	B C 11K
C31	A D 12K
C32	A D 14K
C33	A D 12K
C34	B C 13K
C35	B C 12J
C36	A D 12J
C37	B C 14K
C38	B C 12J
C39	A D 11L
C40	B C 14K
C41	B C 12J
C42	B C 11J
C43	A D 11L
C44	A D 10L
C45	B C 14J
C46	B C 14J
C47	A D 15K
C48	B C 14K
C49	A D 15L
C50	B C 15L
C52	B C 15K
C55	B C 15J
C56	B C 15M
C57	B C 15M
C58	B C 15M
C59	B C 15M
C60	B C 15M
C61	A D 14M
C62	A D 15M
C63	B C 14N
C64	B C 14N
C201	A D 13F
C202	B C 12F
C203	B C 12F
C205	B C 12F
C207	B C 11F
C220	B C 14G
C401	B C 15O
C402	B C 15N
C403	B C 15M
C404	B C 15N
C405	B C 15N
C406	B C 15N
C407	B C 15N
C501	A D 9N
C502	B C 8J
C503	A D 9M
C504	A D 9L
C506	A D 9M
C507	A D 9K
C508	B C 9K
C509	B C 8K
C510	A D 8L
C511	A D 8L
C513	B C 8L
C514	B C 8L
C515	B C 8L
C516	B C 8L
C517	A D 8M
C518	A D 8M
C519	B C 8M
C520	A D 8M
C521	B C 7K
C522	A D 7L
C523	A D 6K
C524	A D 7M
C525	A D 7K
C527	A D 7J
C528	B C 7J
C529	B C 7J
C530	B C 7I
C532	B C 6J
C537	B C 8L
C538	B C 8L
C539	A D 7J
C907	B C 10N
C912	A D 11O
C913	A D 11N
C914	A D 10N
C917	B C 10O
C918	A D 10O
C922	B C 20N
C923	A D 21N
C924	A D 20L
C925	A D 20M
C926	B C 20M
C1201	A D 19E
C1203	B C 20I
C1204	B C 19H
C1208	B C 18F
C1209	A D 18E
C1210	B C 20F
C1211	A D 20H
C1212	B C 20G
C1213	B C 20H
C1214	B C 20H
C1215	A D 20F
C1216	B C 20G
C1217	B C 19H
C1218	B C 19G
C1219	B C 19G
C1220	A D 18G
C1222	B C 18G
C1223	B C 17G
C1225	B C 17G
C1226	B C 18G
C1227	B C 18G
C1228	A D 18G
C1229	B C 19F
C1230	B C 19F
C1231	B C 19F
C1232	B C 19F
C1233	B C 19F
C1234	B C 19F
C1235	A D 18F
C1236	B C 20F
C1237	B C 20F
C1238	B C 18F
C1239	B C 18F
C1243	B C 17G
C1244	A D 17F
C1245	B C 18F
C1246	A D 20F
C1248	A D 17E
C1249	B C 17F
C2001	A D 12N
C2002	A D 13N
C2003	A D 14O
C2004	B C 14N
C2005	A D 14N
C2006	B C 13N
C2007	A D 13N
C2008	A D 13N
C2009	B C 13N
C2010	B C 13N
C2011	A D 13N
C2012	A D 14M
C2051	B C 9N
C2052	A D 7O
C2053	B C 8N
C2054	B C 8N
C2055	A D 7M
C2061	A D 19K
C2062	B C 7N
C2063	B C 6N
C2064	A D 6N
C2065	A D 7N
C2201	A D 17M
C2202	A D 17N
C2203	A D 16N
C2204	A D 16N
C2205	A D 16K
C2206	A D 16K
C2207	B C 16K
C2208	B C 17K
C2209	A D 17K
C2210	A D 17K
C2211	A D 17J
C2212	A D 18K
C2213	B C 18K
C2214	A D 19M
C2215	A D 18M
C2216	A D 18M
C2217	A D 18M
C2218	A D 18N
C2219	A D 18N
C2220	A D 18M
C2221	B C 17M
C2222	B C 18J
C2230	B C 18K
C2231	B C 18K
C2251	A D 16K
C2252	B C 16L
C2253	B C 16L
C2254	A D 16K
C2255	B C 16K
C2256	B C 16K
C2257	B C 16J
C2259	A D 16K
C2261	B C 16K
C2262	B C 16K
C3007	B C 5I
C3008	B C 19I
C3011	A D 14D
C3012	B C 14D
C3013	A D 14D
C3015	B C 13D
C3016	B C 13E
C3017	B C 13E
C3018	A D 14F
C3019	B C 14F
C3020	B C 14F
C3022	B C 15C
C3023	B C 16B
C3024	A D 5D
C3025	B C 5C
C3027	A D 5C
C3028	A D 3D
C3029	B C 5C
C3030	A D 5B
C3035	B C 13E
C3036	A D 14D
C3041	A D 13E
C3042	A D 13E
C3043	B C 13C
C3045	B C 13C
C3048	B C 13D
C3049	B C 11H
C3051	B C 7L
C3052	B C 12F
C3053	A D 16C
C3070	A D 13D
C3071	A D 6K
C4001	B C 6L
C4002	A D 15E
C4004	A D 9E
C4006	B C 10E
C4007	B C 11D
C4008	A D 9F
C4009	B C 10D
C4010	A D 10E
C4011	B C 8C
C4012	B C 10E
C4014	B C 10E
C4016	A D 6C
C4017	B C 6C
C4019	B C 11E
C4022	B C 10E
C4024	B C 10D
C4025	B C 8C
C4031	A D 6L
C5001	A D 2M
C5004	A D 1K
C5006	A D 2L
C5101	A D 2L
C5102	A D 2J
C5103	B C 4K
C5104	A D 4M
C5105	A D 3L
C5106	B C 4K
C5107	A D 3K
C5202	A D 3G
C5203	A D 2G
C5204	A D 3G
C5206	A D 1F
C5207	A D 2F
C5208	A D 2H
C5301	A D 2D
C5302	A D 2E
C5303	A D 2D
C5305	A D 4G
C6005	A D 21K
C6006	B C 22L
C6007	A D 21L
C6008	B C 22L
C6012	A D 21M
C6013	B C 22N
C6020	B C 22M
C6021	B C 22L
C6025	B C 20K
C6026	B C 22N
C6027	B C 21L
C6031	A D 21K
C6052	B C 22N
C6053	B C 22N
C6056	B C 22O
C6501	B C 17M
C6502	A D 16M
C6503	A D 16N
C6504	B C 19L
C6505	A D 18L
C6506	A D 20K
C6508	B C 18L
C6509	B C 19L
C6510	A D 18L
C6511	A D 18L
C6512	B C 19L
C6513	A D 18M
C6514	B C 17M
C6515	A D 17N
C6516	A D 18K
C6517	B C 19L
C6519	B C 21K
C6532	B C 22K
C6533	B C 21J
C7011	A D 9A
C7012	B C 10B
C7013	B C 17A
C7014	B C 17A
C7041	A D 15A
C7042	B C 14A
C7206	A D 21E
CONNECTOR	
CN1	A D 16M
CN2001	A D 9O
CN2002	A D 18L
CN3001	A D 7L
CN3007	A D 22I
CN3010	A D 15B
CN5001	A D 3O
CN7001	A D 1D
CN7003	A D 5O
DIODE	
D1	A D 16O
D2	A D 16O
D3	A D 11M
D4	A D 11M
D5	A D 11L
D6	A D 12M
D501	A D 8J
D502	A D 8I
D906	A D 10N
D907	A D 9N
D1201	A D 20E
D2001	A D 16N
D2251	A D 17J
D3001	A D 12H
D3002	A D 6D
D3004	A D 5C
D3005	A D 5C
D3006	A D 6C
D3007	A D 17C
D3008	A D 22E
D3013	B C 9O
D3016	A D 14D
D4003	B C 15D
D5001	B C 3L
D5101	A D 1L
D5102	A D 2K
D5103	A D 4K
D5105	A D 3J
D5203	A D 3H
D5204	A D 3H
D5206	A D 2H
D5207	A D 2H
D5209	A D 2H
D5210	A D 3H
D5212	A D 1H
D5301	A D 2F
D5302	A D 3E
D5303	A D 3F
D5305	A D 1E
D6002	A D 21K
D7001	A D 15A
D7002	A D 16A
D7003	A D 10A
D7043	A D 14A
IC	
IC1	B C 13L
IC501	B C 8K
IC903	B C 10N
IC1201	B C 19G
IC2201	B C 17L
IC3001	B C 12D
IC3003	B C 13D
IC3004	B C 16B
IC7002	A D 8A
IC7042	A D 14A
COIL	
L1	A D 12M
L2	A D 12N
L3	A D 10M
L4	A D 12K
L5	A D 11K
L6	A D 13J
L7	A D 14K
L9	A D 15K
L10	A D 15K
L201	A D 13G
L203	A D 13F
L401	A D 14N
L501	A D 7L
L502	A D 9M
L503	A D 9N
L504	A D 21H
L506	A D 7J
L901	A D 20K
L902	A D 10N
L1201	A D 20G
L1202	A D 20H
L1203	A D 20F
L1204	A D 18G
L1205	A D 17G
L1206	A D 18G
L1207	A D 19F
L1208	A D 18F
L2001	A D 12O
L2201	A D 18K
L2251	A D 16K
L4001	A D 6L
L5201	A D 2F
L5202	A D 1F
L5301	A D 4D
L6001	A D 21L
L6003	A D 21L
L6004	A D 21K
L6025	A D 20K
L6032	A D 22J
L6050	A D 21M
L6501	A D 19L
L7201	A D 22E
TRANSISTOR	
Q1	B C 11M
Q2	B C 10M
Q3	B C 11K
Q4	B C 11J
Q6	B C 15J
Q7	B C 15M
Q8	B C 15M
Q9	B C 15M
Q10	B C 15M
Q401	B C 15N
Q402	B C 15N
Q403	B C 15N
Q404	B C 15N
Q405	B C 15N
Q901	B C 20L
Q902	B C 20L
Q903	B C 21O
Q1201	A D 20F
Q1202	B C 17G
Q1203	B C 17G
Q1204	B C 18F
Q1205	B C 19F
Q1206	B C 17F
Q1207	B C 17F
Q2001	B C 11N
Q2002	B C 11N
Q2003	B C 12N
Q2051	B C 8N
Q2052	B C 7M
Q2053	B C 7M
Q2054	B C 8M
Q2055	B C 8N
Q2061	B C 7M
Q2062	B C 6M
Q2063	B C 6M
Q2201	B C 19L
Q2202	B C 19L
Q2203	B C 19M
Q2204	B C 19M
Q2251	B C 19J
Q2252	B C 19K
Q2253	B C 19J
Q2254	B C 19K
Q2255	B C 17J
Q3001	A D 4I
Q3002	A D 19I
Q3004	B C 6C
Q3005	B C 15G
Q3006	B C 14D
Q3007	B C 14C
Q4001	B C 8D
Q4002	B C 6D
Q4003	B C 9D
Q4004	B C 8D
Q5101	A D 2K
Q5102	A D 4L
Q5301	A D 4F
Q5303	A D 1D
Q5304	A D 2E
Q5305	B C 2E
Q5306	B C 3E
Q5321	A D 1D
Q6030	B C 21J
Q6531	B C 22K
Q7001	B C 10B
Q7002	B C 10B
Q7003	B C 10B
Q7004	B C 11B
Q7005	B C 11B
Q7006	B C 11B
Q7007	B C 12B
Q7008	B C 12B
Q7009	B C 12B
Q7010	B C 12B
Q7011	B C 13B
Q7012	B C 13B
Q7013	B C 13B
Q7014	B C 13B
Q7015	B C 11B
Q7201	A D 21F
RESISTOR	
R1	B C 13M
R2	B C 12M
R3	B C 12M
R4	B C 11N
R5	B C 12M
R6	A D 10L
R7	B C 10L
R8	B C 13J
R9	B C 12I
R11	B C 14K
R12	B C 12J
R14	B C 11J
R15	B C 11J
R16	B C 11J
R17	B C 11K
R18	B C 12J
R19	B C 12K
R20	B C 11K
R21	B C 15O
R22	B C 14N
R24	B C 15J
R25	A D 14J
R26	B C 15J
R27	B C 15K
R36	B C 14C
R37	B C 15J
R38	A D 11K
R201	B C 12F
R202	B C 11F
R401	B C 15N
R402	B C 15N
R403	B C 15N
R404	B C 15N
R405	B C 15N
R407	B C 15N
R408	B C 15N
R501	B C 9K
R503	B C 8L
R504	B C 8L
R505	B C 8L
R506	B C 8L
R507	B C 8L
R508	B C 8K
R510	B C 7I
R903	B C 22B
R904	B C 22B
R905	B C 21B
R906	B C 20N
R907	B C 20N
R908	B C 20N
R912	B C 20N
R913	B C 20N
R915	B C 21O
R916	B C 21N
R917	A D 20M
R918	A D 20M
R919	A D 21M
R920	B C 20L
R921	B C 20L
R922	B C 21N
R1201	B C 19E
R1202	B C 20E
R1203	A D 19H
R1204	A D 18H
R1205	A D 18I
R1206	A D 21H
R1207	B C 20H
R1208	B C 20H
R1209	B C 20H
R1210	B C 20H
R1211	B C 20H
R1212	B C 17G
R1213	B C 18G
R1214	B C 18G
R1215	B C 17F
R1216	B C 18G
R1217	B C 19G
R1218	B C 18G
R1220	A D 17E
R1221	B C 20I
R1222	B C 19F
R1223	B C 20H
R1224	B C 18F
R1225	B C 17F
R1226	B C 18F
R1227	B C 17F
R1228	B C 18F
R1229	B C 19H
R1230	B C 18F
R1231	A D 17E
R2003	B C 12N
R2004	B C 12N
R2007	B C 13N
R2010	B C 13M
R2013	B C 14N
R2014	B C 13N
R2015	B C 14O
R2016	B C 13N
R2017	B C 12N
R2018	B C 12N
R2019	B C 12N
R2021	B C 14N
R2022	A D 15N
R2023	A D 15J
R2024	B C 13O
R2051	B C 8N
R2052	B C 8N
R2053	B C 8N
R2054	B C 8N
R2055	B C 8N
R2056	A D 8N
R2057	B C 7M
R2058	B C 7M
R2059	B C 8M
R2060	B C 8N
R2061	B C 7N
R2062	B C 6N
R2063	A D 7N
R2064	B C 6M
R2065	B C 6M
R2201	B C 16M
R2202	B C 16M
R2203	B C 16M
R2204	B C 16M
R2205	B C 16M
R2206	B C 16M
R2207	B C 16M
R2208	B C 16M
R2209	B C 19M
R2210	B C 18M
R2211	B C 19M
R2212	B C 19M
R2213	B C 18M
R2214	B C 19M
R2215	B C 18M
R2216	B C 18N
R2217	B C 18N
R2218	B C 17M
R2219	B C 17M
R2220	B C 19L
R2230	B C 17J
R2231	B C 18K
R2251	B C 17K
R2252	B C 17K
R2253	B C 17K
R2254	B C 19K
R2255	A D 18J
R2256	B C 19K
R2257	B C 17J
R2258	B C 15L
R2259	B C 18J
R3003	B C 12C
R3004	A D 12B
R3005	A D 12B
R3006	A D 12B
R3007	A D 12B
R3008	A D 12B
R3009	A D 12B
R3010	A D 13B
R3011	A D 13B
R3012	A D 13B
R3013	B C 14C
R3014	A D 13B
R3015	A D 14C
R3016	B C 13C
R3017	B C 13C
R3018	B C 13C
R3019	B C 13C
R3020	B C 13C
R3021	B C 13C
R3022	B C 14C
R3026	B C 15D
R3027	B C 15D
R3028	B C 15D
R3031	B C 13E
R3032	B C 13E
R3035	B C 14E
R3042	B C 15C
R3043	B C 14F
R3044	B C 14F
R3045	B C 14F
R3046	B C 14F
R3054	B C 11F
R3055	B C 11F
R3056	B C 11F
R3057	B C 11F
R3058	B C 11F
R3059	B C 10F
R3060	B C 10F
R3064	A D 10F
R3066	B C 10E
R3078	B C 10D
R3079	B C 10D
R3080	B C 10C
R3081	B C 10C
R3082	B C 10C
R3083	B C 10C
R3084	A D 10B
R3085	B C 10C
R3086	A D 9B
R3087	A D 9B
R3088	A D 10B
R3089	A D 10B
R3090	B C 11C
R3091	B C 11C
R3092	B C 11C
R3093	B C 11C
R3094	B C 11C
R3095	A D 10B
R3096	A D 11B
R3097	A D 11B
R3098	A D 11B
R3099	A D 11B
R3100	B C 11C
R3205	B C 7G
R3206	B C 7F
R3207	B C 7G
R3208	B C 7G
R3209	B C 11H
R3210	B C 6C
R3211	B C 8D
R3212	B C 15E
R3213	B C 15E
R3214	B C 9F
R3215	B C 9F
R3216	B C 6D
R3217	B C 6C
R3218	B C 8F
R3219	B C 17E
R3220	B C 13D
R3221	B C 15F
R3222	B C 13D
R3223	B C 13E
R3224	B C 13E
R3225	B C 9F
R3226	B C 17B
R3227	B C 16C
R3232	B C 5C
R3233	B C 6C
R3234	B C 6D
R3235	A D 22E
R3236	B C 17E
R3237	B C 16C
R3238	B C 16C
R3240	B C 5B
R3241	B C 6B
R3242	B C 14B
R3243	B C 14C
R3244	B C 13D
R3245	B C 14D
R3246	B C 17E
R3247	B C 17D
R3248	B C 17E
R3252	A D 6L
R3253	A D 6L
R3254	B C 9G
R3255	A D 9G
R4001	B C 15D
R4002	B C 15E
R4003	B C 11E
R4004	B C 13D
R4010	B C 10D
R4011	B C 10E
R4012	B C 10D
R4018	B C 10E
R4019	B C 10F
R4021	B C 10E
R4022	B C 6C
R4024	A D 9E
R4025	B C 15E
R5001	A D 3O
R5101	A D 3L
R5102	A D 3L
R5103	A D 4L
R5104	A D 1L
R5105	B C 4L
R5106	A D 3K
R5107	A D 3J
R5108	B C 4K
R5109	A D 3L
R5110	B C 3K
R5111	B C 4K
R5112	B C 3K
R5302	B C 3F
R5303	B C 3E
R5304	B C 3G
R5305	B C 1E
R5306	A D 1E
R5310	B C 3F
R5312	B C 4F
R5313	B C 4F
R5317	B C 3G
R5332	A D 2E
R5333	A D 2E
R6020	B C 21M
R6021	B C 21L
R6026	B C 21L
R6030	B C 21J
R6031	B C 22K
R6032	B C 21J
R6033	B C 21K
R6050	A D 21N
R6051	A D 22M
R6056	B C 21N
R6502	B C 18K
R6503	B C 21J
R6504	B C 21J
R6531	B C 21J
R6532	B C 21K
R6533	B C 21J
R7001	B C 12A
R7002	B C 12A
R7003	B C 12A
R7004	B C 13A
R7005	B C 13A
R7006	B C 13A
R7007	B C 13A
R7008	B C 12A
R7009	A D 11A
R7010	A D 12A
R7015	B C 9A
R7020	B C 16A
R7021	B C 17B
R7022	B C 16A
R7023	B C 6B
R7024	B C 5B
R7025	B C 3B
R7026	B C 3B
R7030	B C 16B
R7031	B C 7A
R7032	B C 5B
R7033	B C 5B
R7034	B C 4B
R7035	B C 4B
R7036	B C 4B
R7037	B C 4B
R7046	B C 14A
R7047	B C 9P
R7048	B C 8P
R7155	B C 15P
R7156	B C 16P
R7202	B C 22G
R7203	B C 21F
R7204	B C 21F
SWITCH	
S3001	A D 18C
S3002	A D 4E
S7001	A D 22B
S7002	A D 17B
S7003	A D 16B
S7004	A D 7B
S7006	A D 6B
S7008	A D 5B
S7010	A D 4B
S7011	A D 3B
S7012	A D 3B
S7013	A D 2B
S7014	A D 1B
S7015	A D 1B
S7016	A D 17B
S7017	A D 16B
S7018	A D 8B
S7030	A D 9P
S7031	A D 8P
TEST POINT	
TP106	A D 21G
TP111	A D 21G
TP2253	A D 21G
TP2254	A D 21F
TP4001	A D 21F
TP7001	A D 4A
TPGND	A D 3A
OTHER	
B1	B C 11L
B2	B C 10L
B3	B C 11K
B4	B C 11J
B6	B C 15K
B502	B C 7J
B503	B C 9M
B903	A D 10M
B904	A D 11M
B906	B C 10N
B1201	B C 17G
B1202	B C 17G
B1203	B C 18F
B2051	B C 7N
B3001	B C 5C
B5302	B C 4H
B5303	A D 2H
B6020	A D 12G
B6030	B C 21J
B6531	B C 21J
B7001	B C 4B
B7002	B C 4B
B7003	B C 5B
BT3001	A D 20C
CF6031	A D 22J
CP3001	A D 4H
CP3002	B C 4H
CP4001	A D 3E
CP4002	B C 3E
DI7001	A D 12A
F5001	A D 1N
FC5001	A D 1N
FC5002	A D 1M
FW3001	A D 21H
FW7104	A D 15P
FW7106	A D 20D
J1	A D 20O
J2	A D 21O
J7101	A D 20A
J7103	A D 22A
J7104	A D 16P
J7105	A D 15P
JS3001	A D 7G
K2251	B C 15K
K2252	B C 15L
K2253	B C 16L
K5101	A D 2J
K5102	A D 2L
LC1201	A D 20E
LF5002	A D 3N
PC3001	A D 15F
PC3002	A D 9F
PC5101	A D 4K
T2051	A D 8N
T2052	A D 7N
T5001	A D 3H
TU6001	A D 22O
UN7001	A D 5P
VA5001	A D 3N
VR2251	A D 20K
VR6601	A D 21J
X2	A D 14K
X3001	A D 13E
X3002	A D 13F

4.13 MAIN, ADV.JOG AND C.BOX/R.PAUSE CIRCUIT BOARDS

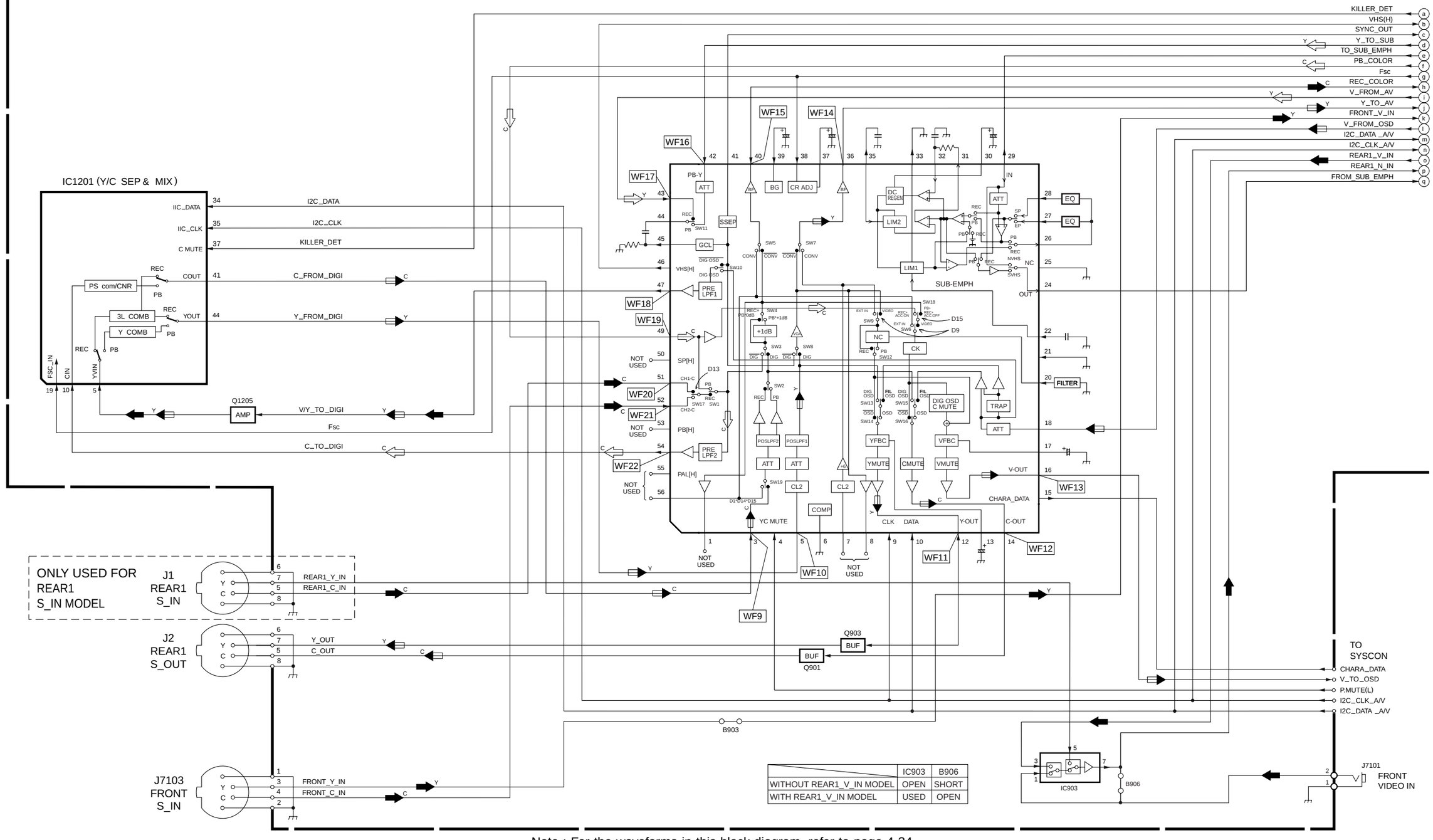
<03> MAIN
LPB10187-001C

DANGEROUS VOLTAGE

CAUTION :
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).
ATTENTION :
REPLACER PAR DES FUSIBLE DE MEME TYPE.

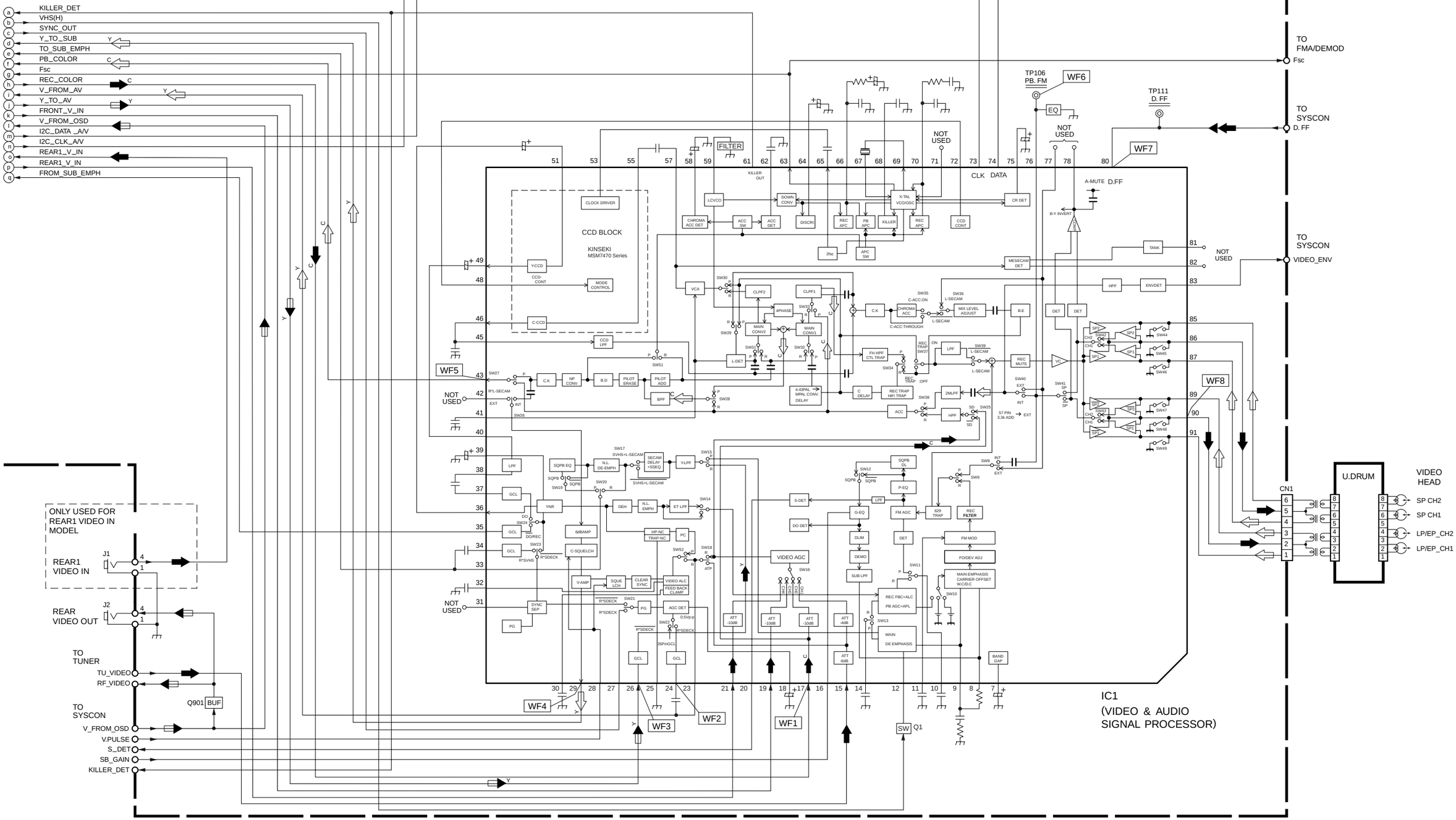


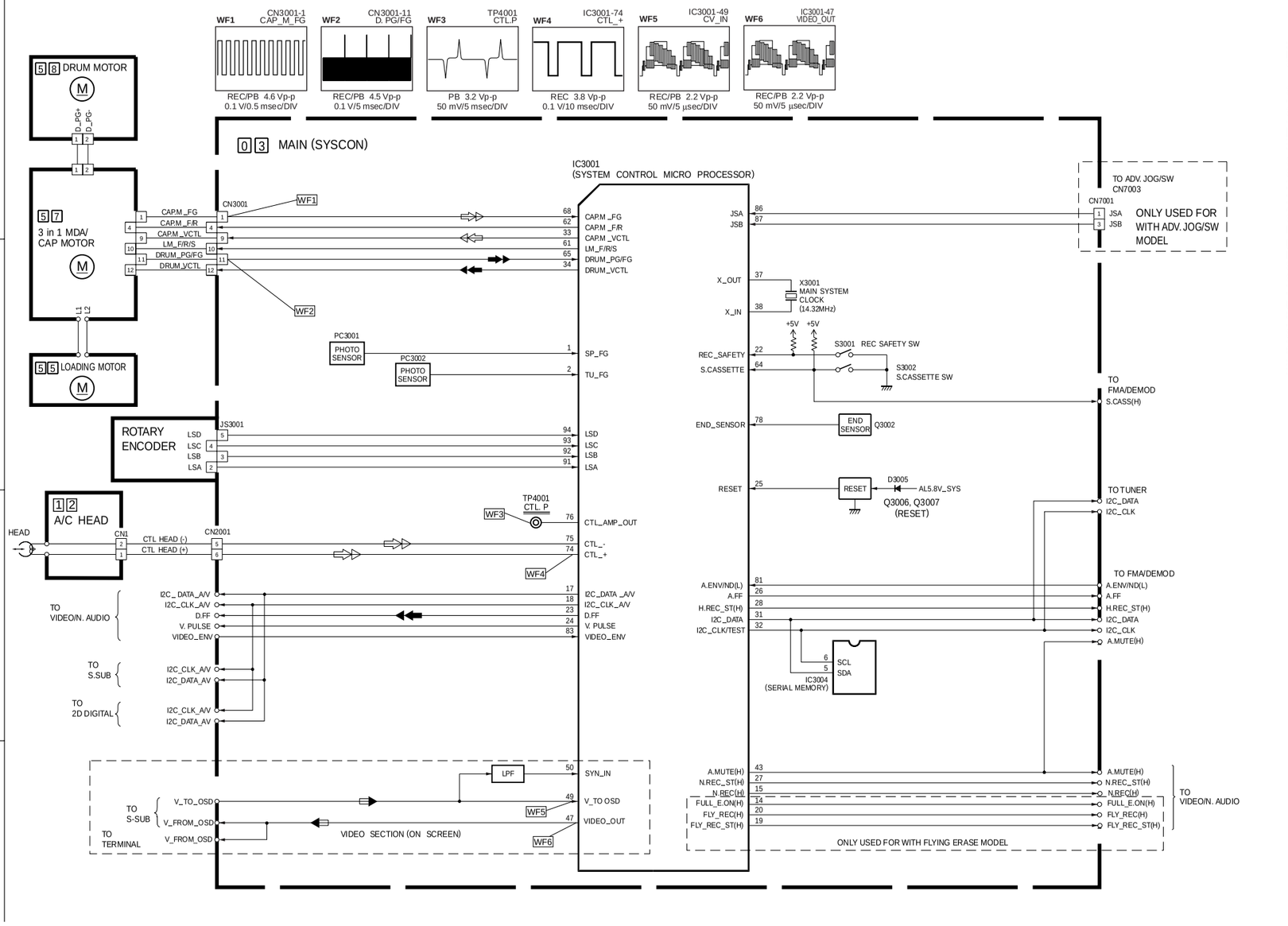
0 3 MAIN (S-SUB, 2D DIGITAL, TERMIANL)

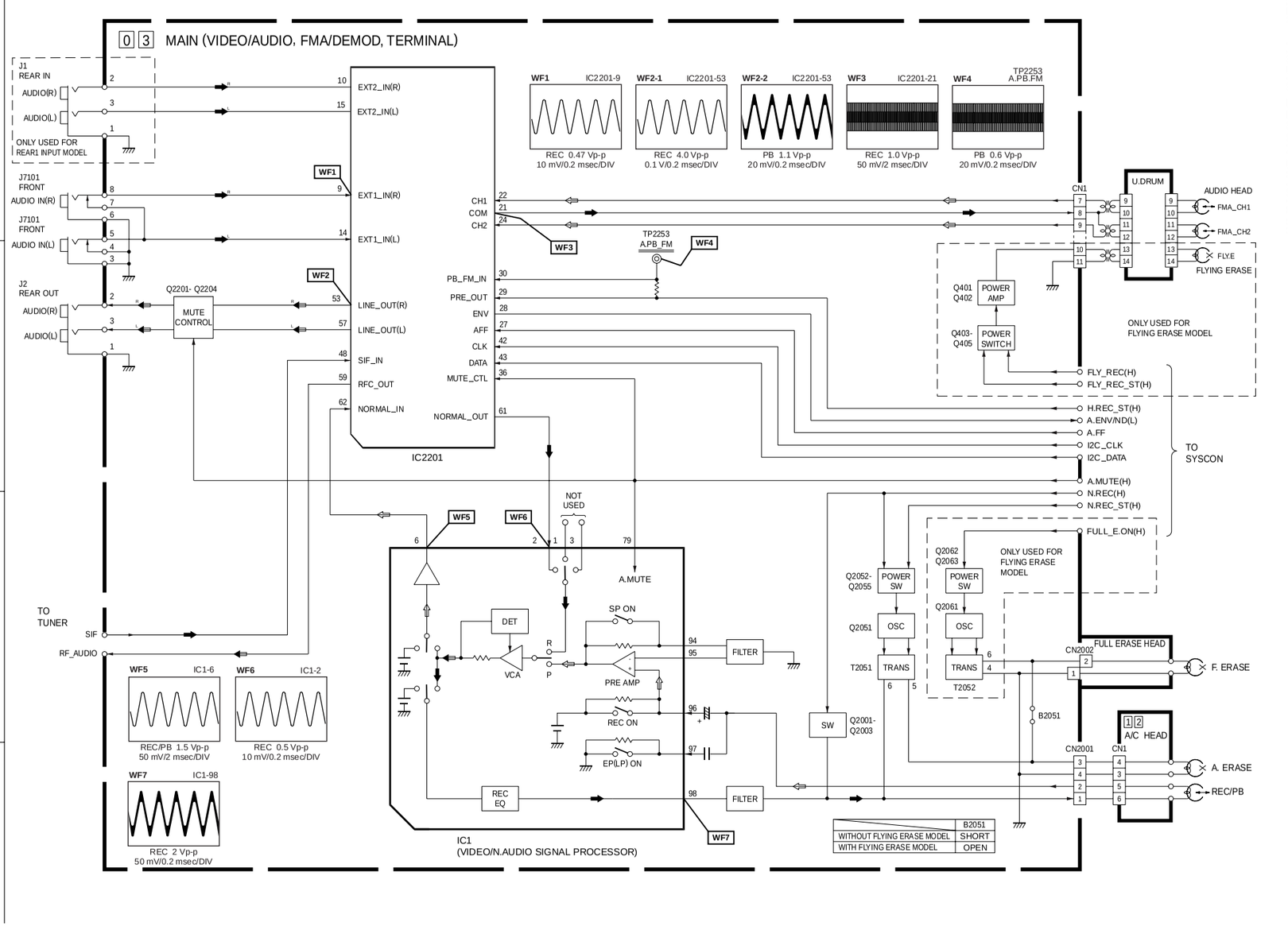


Note : For the waveforms in this block diagram, refer to page 4-34.

0 3 MAIN (VIDEO/N. AUDIO, TERMINAL)




WF1 CN3001-1 CAP_M_FG
REC/PB 4.6 Vp-p 0.1 V/0.5 msec/DIV
WF2 CN3001-11 D. PG/FG
REC/PB 4.5 Vp-p 0.1 V/5 msec/DIV
WF3 TP4001 CTL P
PB 3.2 Vp-p 50 mV/5 msec/DIV
WF4 IC3001-74 CTL_+
REC 3.8 Vp-p 0.1 V/10 msec/DIV
WF5 IC3001-49 CV_IN
REC/PB 2.2 Vp-p 50 mV/5 µsec/DIV
WF6 IC3001-47 VIDEO_OUT
REC/PB 2.2 Vp-p 50 mV/5 µsec/DIV
58 DRUM MOTOR
57 3 in 1 MDA/ CAP MOTOR
55 LOADING MOTOR
03 MAIN (SYSCON)
IC3001 (SYSTEM CONTROL MICRO PROCESSOR)
CAP.M _FG
CAP.M _F/R
CAP.M _VCTL
LM_F/R/S
DRUM_PG/FG
DRUM_VCTL
PC3001 PHOTO SENSOR
PC3002 PHOTO SENSOR
SP_FG
TU_FG
ROTARY ENCODER
JS3001
LSD
LSC
LSB
LSA
12 A/C HEAD
HEAD
CN1
CN2001
CTL HEAD (-)
CTL HEAD (+)
TP4001 CTL P
CTL_AMP_OUT
CTL_-
CTL_+
TO VIDEO/N. AUDIO
I2C_ DATA_A/V
I2C_CLK_A/V
D.FF
V. PULSE
VIDEO_ENV
TO S.SUB
TO 2D DIGITAL
TO S-SUB
TO TERMINAL
V_TO_OSD
V_FROM_OSD
LPF
SYN_IN
V_TO OSD
VIDEO_OUT
VIDEO SECTION (ON SCREEN)
X_OUT
X_IN
X3001 MAIN SYSTEM CLOCK (14.32MHz)
+5V
REC_SAFETY
S.CASSETTE
S3001 REC SAFETY SW
S3002 S.CASSETTE SW
END_SENSOR
END SENSOR
Q3002
RESET
D3005
AL5.8V_SYS
Q3006, Q3007 (RESET)
JSA
JSB
TO ADV. JOG/SW CN7003
CN7001
ONLY USED FOR WITH ADV. JOG/SW MODEL
TO FMA/DEMOD S.CASS(H)
TO TUNER
I2C_DATA
I2C_CLK
TO FMA/DEMOD
A.ENV/IND(L)
A.FF
H.REC_ST(H)
I2C_DATA
I2C_CLK/TEST
A.MUTE(H)
IC3004 (SERIAL MEMORY)
SCL
SDA
N.REC_ST(H)
FULL_E.ON(H)
FLY_REC(H)
FLY_REC_ST(H)
TO VIDEO/N. AUDIO
ONLY USED FOR WITH FLYING ERASE MODEL


03 MAIN (VIDEO/AUDIO, FMA/DEMOD, TERMINAL)
J1 REAR IN
AUDIO(R)
AUDIO(L)
ONLY USED FOR REAR1 INPUT MODEL
J7101 FRONT AUDIO IN(R)
J7101 FRONT AUDIO IN(L)
J2 REAR OUT
Q2201- Q2204 MUTE CONTROL
EXT2_IN(R)
EXT2_IN(L)
EXT1_IN(R)
EXT1_IN(L)
LINE_OUT(R)
LINE_OUT(L)
SIF_IN
RFC_OUT
NORMAL_IN
CH1
COM
CH2
PB_FM_IN
PRE_OUT
ENV
AFF
CLK
DATA
MUTE_CTL
NORMAL_OUT
IC2201
WF1 IC2201-9
REC 0.47 Vp-p 10 mV/0.2 msec/DIV
WF2-1 IC2201-53
REC 4.0 Vp-p 0.1 V/0.2 msec/DIV
WF2-2 IC2201-53
PB 1.1 Vp-p 20 mV/0.2 msec/DIV
WF3 IC2201-21
REC 1.0 Vp-p 50 mV/2 msec/DIV
WF4 TP2253 A.P.B.FM
PB 0.6 Vp-p 20 mV/0.2 msec/DIV
TP2253 A.P.B_FM
U.DRUM
AUDIO HEAD
FMA_CH1
FMA_CH2
FLYE
FLYING ERASE
Q401 Q402 POWER AMP
Q403- Q405 POWER SWITCH
ONLY USED FOR FLYING ERASE MODEL
FLY_REC(H)
FLY_REC_ST(H)
H.REC_ST(H)
A.ENV/IND(L)
A.FF
I2C _CLK
I2C _DATA
TO SYSCON
A.MUTE(H)
N.REC(H)
N.REC_ST(H)
FULL_E.ON(H)
NOT USED
A.MUTE
SP ON
DET
VCA
PRE AMP
REC ON
EP(LP) ON
FILTER
REC EQ
IC1 (VIDEO/N.AUDIO SIGNAL PROCESSOR)
TO TUNER
SIF
RF_AUDIO
WF5 IC1-6
REC/PB 1.5 Vp-p 50 mV/2 msec/DIV
WF6 IC1-2
REC 0.5 Vp-p 10 mV/0.2 msec/DIV
WF7 IC1-98
REC 2 Vp-p 50 mV/0.2 msec/DIV
Q2052- Q2055 POWER SW
Q2062 Q2063 POWER SW
Q2061 OSC
Q2051 OSC
T2051 TRANS
T2052 TRANS
SW Q2001- Q2003
ONLY USED FOR FLYING ERASE MODEL
FULL ERASE HEAD
CN2002
F. ERASE
B2051
12 A/C HEAD
CN2001
CN1
A. ERASE
REC/PB
WITHOUT FLYING ERASE MODEL SHORT
WITH FLYING ERASE MODEL OPEN

4.17 CPU PIN FUNCTION

<SYSCON IC3001>

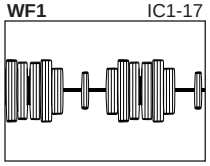
PIN NO.	LABEL	IN/OUT	FUNCTION
1	SP_FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
2	TU_FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
3	R.PAUSE/COMPU_IN	IN	REMOTE PAUSE CONTROL/A/V COMPULINK INPUT
4	DIG7	OUT	LED DRIVE
5	RC	IN	REMOTE CONTROL DATA INPUT
6	D_A	OUT	LED DRIVE
7	D_B	OUT	LED DRIVE
8	D_C	OUT	LED DRIVE
9	D_D	OUT	LED DRIVE
10	D_E	OUT	LED DRIVE
11	D_F	OUT	LED DRIVE
12	D_G	OUT	LED DRIVE
13	RMO	OUT	REMOTE CONTROL(SATELLITE RECEIVER)OUTPUT
14	FULL. E_ON[H]	OUT	FULL ERASE ON:H
15	N. REC[H]	OUT	NORMAL AUDIO REC MODE(REC:H)
16	AGC_CTL	IN	DETECTION SIGNAL FOR AGC
17	I2C_D_A/V	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR THE VIDEO/AUDIO IC
18	I2C_C_A/V	OUT	SERIAL DATA TRANSFER CLOCK FOR THE VIDEO/AUDIO IC
19	SP_SHORT(H)/FLY_REC_ST[H]	OUT	MODE SELECT/ FLY REC START: H
20	EP_SHORT(H)/FLY_REC[H]	OUT	MODE SELECT/ REC TIMING CONTROL(FLY ERASE ON: H)
21	SIDE BAND GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
22	REC_SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
23	D.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
24	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
25	RESET	-	RESET TERMINAL
26	A.FF	OUT	AUDIO FF OUTPUT
27	N.REC_ST(H)	OUT	NORMAL AUDIO REC START:H
28	H.REC_ST(H)	OUT	HiFi AUDIO REC START:H
29	NC	-	NC
30	NC	-	NC
31	I2C_DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
32	I2C_CLK/TEST	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC/MECHANISM TEST SIGNAL
33	CAP_CTL_V	OUT	CAPSTAN MOTOR CONTROL
34	DRUM_CTL_V	OUT	DRUM MOTOR CONTROL
35	CH_SW	OUT	RF CHANNEL SWITCHING
36	VDD	-	SYSTEM POWER
37	X_OUT	-	SYSTEM CLOCK(14.32MHz)
38	X_IN	-	SYSTEM CLOCK(14.32MHz)
39	VSS	-	GND
40	XC_IN	-	TIMER CLOCK(32.768MHz)
41	XC_OUT	-	TIMER CLOCK(32.768MHz)
42	CLK SEL	-	SELECT FOR BACKUP METHOD(LITHIUM OR E.CAPACITOR):H
43	A.MUTE[H]	OUT	AUDIO MUTE CONTROL (MUTE ON:H)
44	P.MUTE[L]	OUT	PICTURE CONTROL (MUTE ON:L)
45	P20	-	NC
46	CONV_CTL[H]	IN	R/F CONVERTER ON/OFF CONTROL
47	VIDEO_OSD_OUT	OUT	COMPOSITE VIDEO SIGNAL OUTPUT
48	VSS2	-	GND
49	V_TO_OSD	IN	COMPOSITE VIDEO SIGNAL INPUT
50	SYS_IN	IN	COMPOSITE SYNCHRONIZING SIGNAL FOR SERVO, VERTICAL SYNCHRONIZING SIGNAL FOR OSD

PIN NO.	LABEL	IN/OUT	FUNCTION
51	VDD2	-	SYSTEM POWER
52	AFCC	IN	FILTER INPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
53	AFCLPF	OUT	FILTER OUTPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
54	FSCI	-	GND
55	FSCLPF	-	GND
56	ET_REC [H]	IN/OUT	ET REC:H
57	CTL_GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
58	CHARAE	OUT	OSD CHARACTER DATA (FRINGE) OUTPUT
59	P.CTL [H]	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
60	CHARAM	OUT	OSD CHARACTER DATA OUTPUT
61	LM_F/R/S	OUT	LODING MOTOR DRIVE
62	CAP. M_F/R	OUT	CAPSTAN MOTOR DRIVE
63	HS_FR	OUT	HI SPEED FF/REW
64	S. CASSETTE	IN	DETECTION SIGNAL FOR SVHS CASSETTE (SVHS: H)
65	D.PG/FG_IN	IN	DRUM FG PULSE, DRUM PICKUP PULSE(SWITCHING PULSE)INPUT
66	S_DET	IN	S-VHS MODE:H
67	C. FG_AMP_OUT	OUT	SET-UP OUTPUT FOR CAPSTAN FG AMPLIFICATION FACTOR
68	C.FG_IN	IN	CAPSTAN FG PULSE INPUT
69	AMP_VREF_OUT	OUT	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
70	AMP_VREF_IN	IN	AMP CIRCUIT REFERENCE VOLTAGE INPUT
71	AVSS	-	GND FOR ANALOG CIRCUIT
72	AMP_C	IN	CAPACITOR CONNECT TERMINAL FOR CTL AMP CIRCUIT
73	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
74	CTL(+)	IN/OUT	CONTROL SIGNAL(+)
75	CTL(-)	IN/OUT	CONTORL SIGNAL(-)
76	CTL_AMP_OUT	OUT	CTL PULSE OUTPUT
77	PROTECT	IN	DETECTION SIGNAL FOR SWITCHING POWER SUPPLY
78	END_SENSOR	IN	END SENSOR
79	AFC	IN	TUNING CHECK
80	LED	IN	SAP DETECT
81	A. ENV/ND [L]	IN	AUDIO PB FM ENV. INPUT/NON HiFi MODEL:L
82	COMP_OUT	OUT	A/V COMPULINK OUTPUT
83	VIDEO_ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
84	KILLER_DET	-	NC
85	START_SENSOR	IN	START SENSOR
86	JSA	IN	INPUT FOR THE JOG SHUTTLE
87	JSB	IN	INPUT FOR THE JOG SHUTTLE
88	KEY1	IN	OPERATION CONTROL SIGNAL
89	KEY2	IN	OPERATION CONTROL SIGNAL
90	POWER_DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
91	LSA	IN	MECHANISM MODE DETECT(A)
92	LSB	IN	MECHANISM MODE DETECT(B)
93	LSC	IN	MECHANISM MODE DETECT(C)
94	LSD	IN	MECHANISM MODE DETECT(D)
95	DIG1	OUT	LED DRIVE
96	DIG2	OUT	LED DRIVE
97	DIG3	OUT	LED DRIVE
98	DIG4	OUT	LED DRIVE
99	DIG5	OUT	LED DRIVE
100	Y/C IN[H]/DIG6	OUT	REAR1 INPUT SIGNAL CONTROL (Y/C:H)/LED DRIVE

4.18 WAVEFORMS

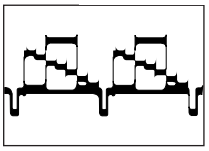
< VIDEO >

WF1 IC1-17



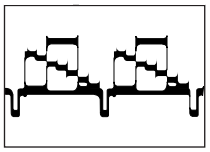
REC 0.68 Vp-p
20 mV/5 µsec/DIV

WF2 IC1-17



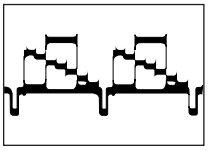
PB 0.5 Vp-p
10 mV/5 µsec/DIV

WF3 IC1-26



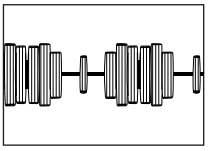
REC/PB 0.5 Vp-p
10 mV/5 µsec/DIV

WF4 IC1-29



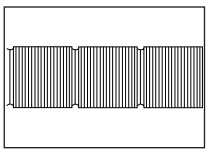
PB 2.1 Vp-p
50 mV/5 µsec/DIV

WF5 IC1-43



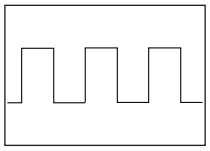
PB 0.6 Vp-p
20 mV/5 µsec/DIV

WF6 TP106 PB.FM



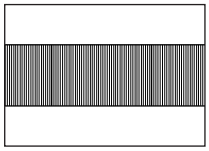
PB 0.4 Vp-p
0.1 V/5 msec/DIV

WF7 TP111 D.FF



REC/PB 3.3 Vp-p
0.1 V/5 msec/DIV

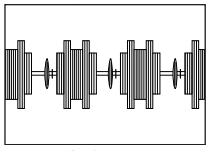
WF8 IC1-90



REC 3 Vp-p
0.1 V/1 msec/DIV

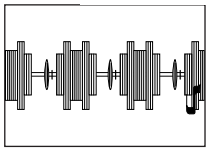
< S-SUB >

WF9-1 IC501-3



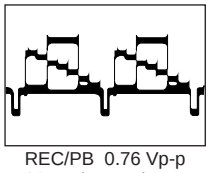
REC 0.57 Vp-p
20 mV/5 µsec/DIV

WF9-2 IC501-3



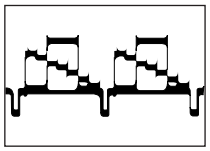
PB 0.64 Vp-p
20 mV/5 µsec/DIV

WF10 IC501-5



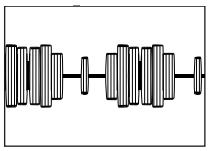
REC/PB 0.76 Vp-p
20 mV/5 µsec/DIV

WF11 IC501-12



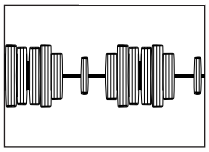
REC/PB 2 Vp-p
50 mV/5 µsec/DIV

WF12-1 IC501-14



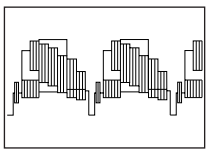
REC 1.5 Vp-p
50 mV/5 µsec/DIV

WF12-2 IC501-14



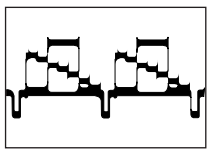
PB 1.2 Vp-p
50 mV/5 µsec/DIV

WF13 IC501-16



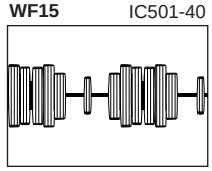
REC/PB 2.2 Vp-p
50 mV/5 µsec/DIV

WF14 IC501-36



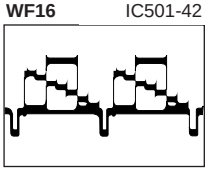
REC/PB 0.5 Vp-p
10 mV/5 µsec/DIV

WF15 IC501-40



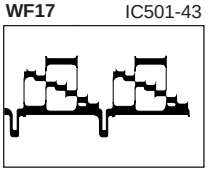
REC 0.7 Vp-p
20 mV/5 µsec/DIV

WF16 IC501-42



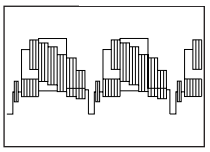
PB 2.1 Vp-p
50 mV/5 µsec/DIV

WF17 IC501-43



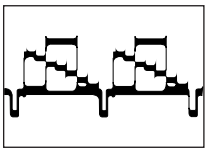
PB 0.5 Vp-p
10 mV/5 µsec/DIV

WF18-1 IC501-47



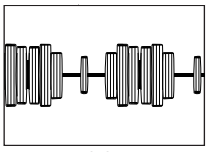
REC 1.7 Vp-p
50 mV/5 µsec/DIV

WF18-2 IC501-47



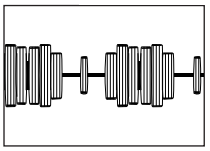
PB 1.7 Vp-p
50 mV/5 µsec/DIV

WF19 IC501-49



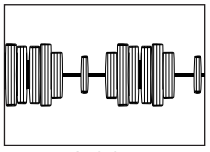
PB 0.6 Vp-p
20 mV/5 µsec/DIV

WF20 IC501-51



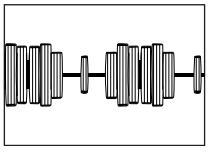
REC 0.6 Vp-p
20 mV/5 µsec/DIV

WF21 IC501-52



REC 0.6 Vp-p
20 mV/5 µsec/DIV

WF22 IC501-54



PB 1.5 Vp-p
50 mV/5 µsec/DIV

SECTION 5
PARTS LIST

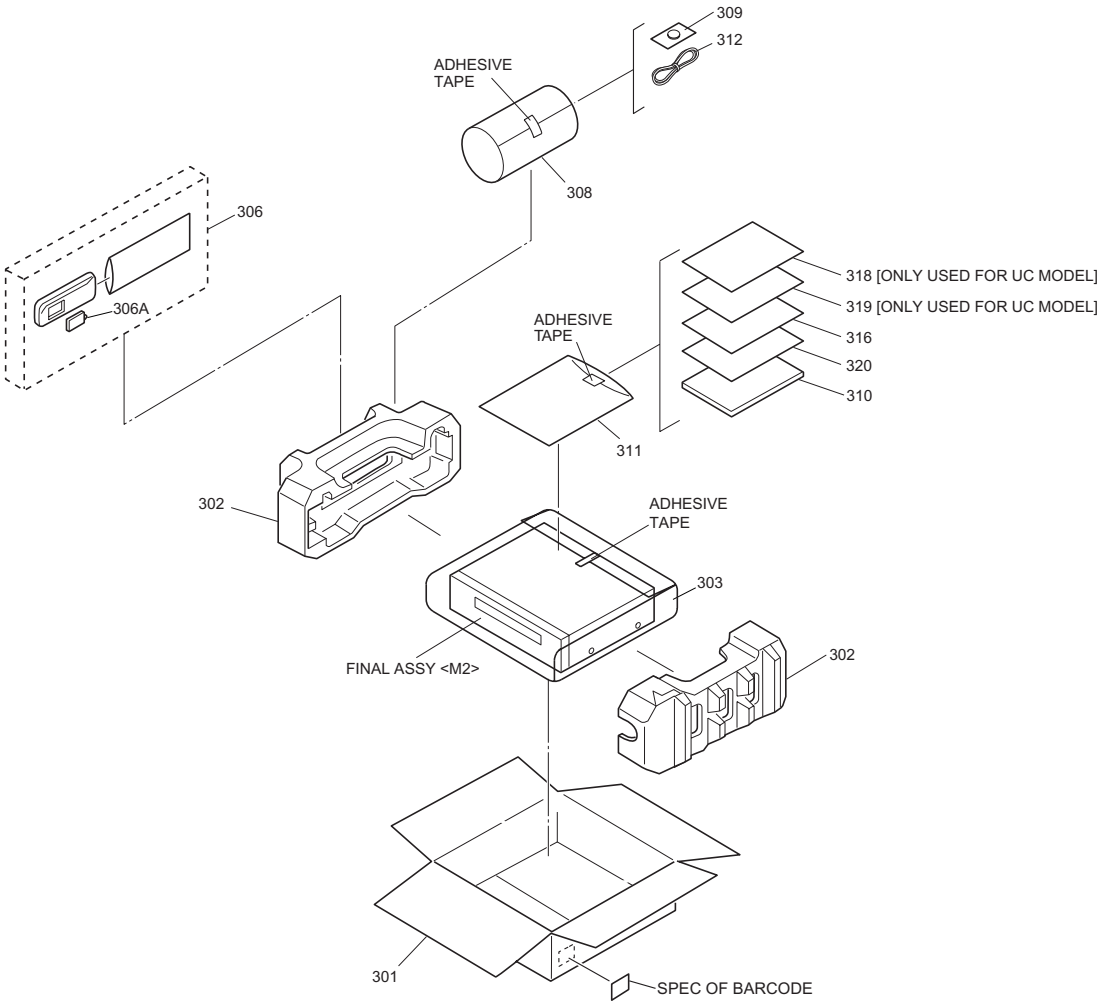
SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 EXPLODED VIEW

5.1.1 PACKING AND ACCESSORY ASSEMBLY <M1>

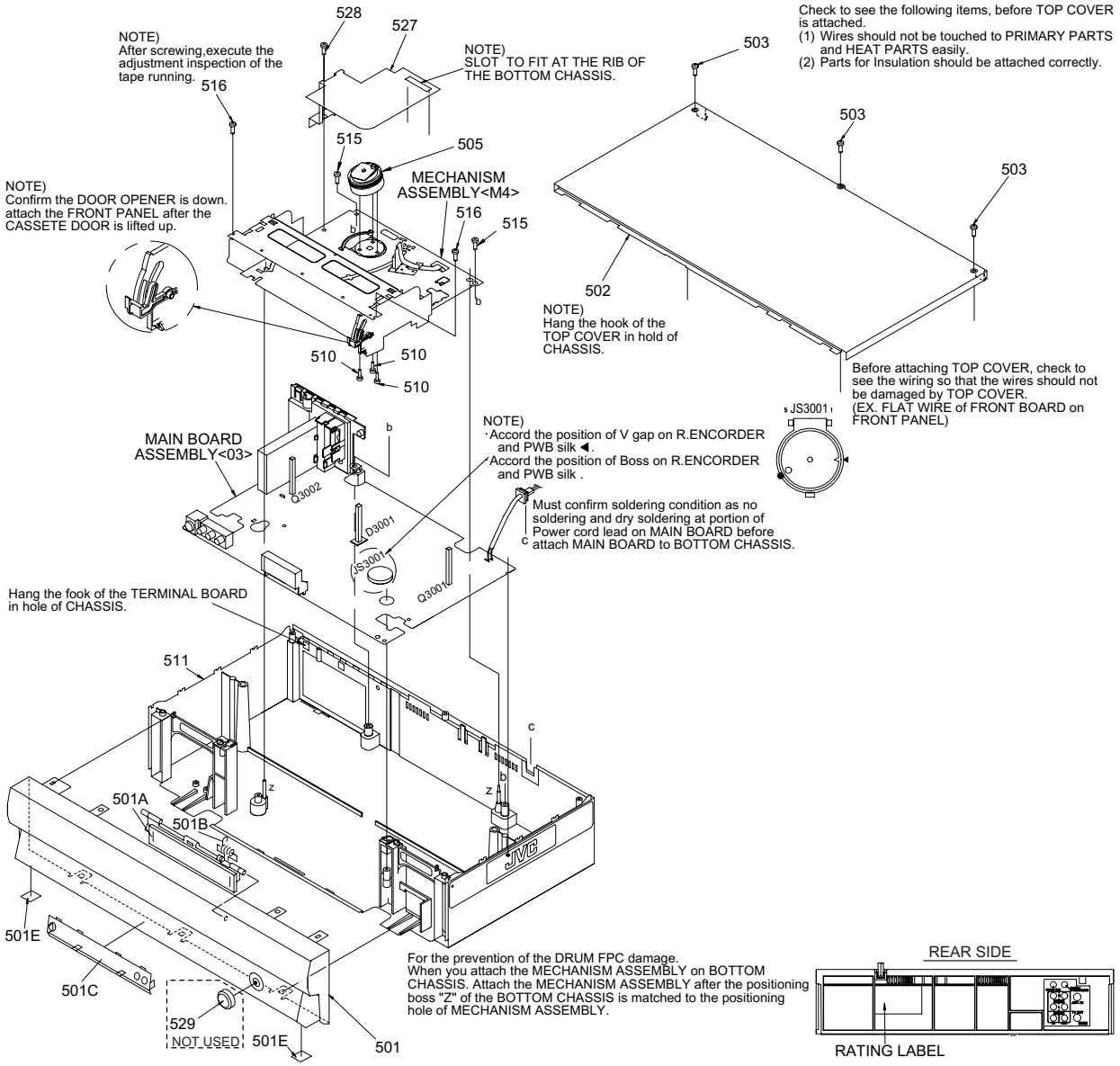
The instruction manual to be provided with this product will differ according to the destination.



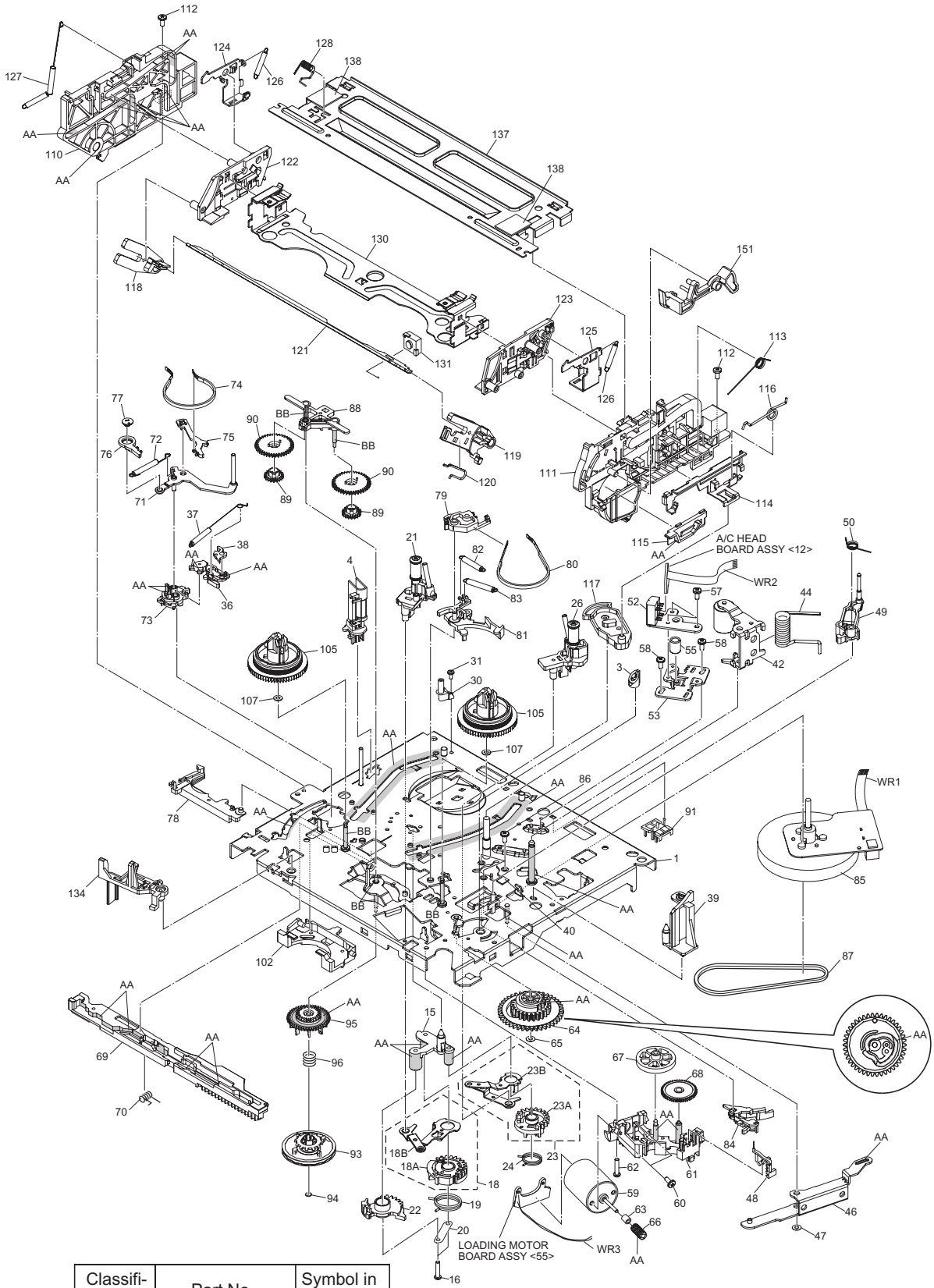
5.1.2 FINAL ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.


528
527
NOTE)
After screwing,execute the adjustment inspection of the tape running.
NOTE)
SLOT TO FIT AT THE RIB OF THE BOTTOM CHASSIS.
516
515
505
MECHANISM ASSEMBLY<M4>
NOTE)
Confirm the DOOR OPENER is down. attach the FRONT PANEL after the CASSETE DOOR is lifted up.
510
MAIN BOARD ASSEMBLY<03>
Q3002
D3001
JS3001
Q3001
NOTE)
・Accord the position of V gap on R.ENCORDER and PWB silk ◄.
・Accord the position of Boss on R.ENCORDER and PWB silk .
Must confirm soldering condition as no soldering and dry soldering at portion of Power cord lead on MAIN BOARD before attach MAIN BOARD to BOTTOM CHASSIS.
Hang the fook of the TERMINAL BOARD in hole of CHASSIS.
511
501A
501B
501E
501C
529
NOT USED
501
Check to see the following items, before TOP COVER is attached.
(1) Wires should not be touched to PRIMARY PARTS and HEAT PARTS easily.
(2) Parts for Insulation should be attached correctly.
503
502
NOTE)
Hang the hook of the TOP COVER in hold of CHASSIS.
Before attaching TOP COVER, check to see the wiring so that the wires should not be damaged by TOP COVER.
(EX. FLAT WIRE of FRONT BOARD on FRONT PANEL)
JS3001
For the prevention of the DRUM FPC damage.
When you attach the MECHANISM ASSEMBLY on BOTTOM CHASSIS. Attach the MECHANISM ASSEMBLY after the positioning boss "Z" of the BOTTOM CHASSIS is matched to the positioning hole of MECHANISM ASSEMBLY.
REAR SIDE
RATING LABEL

5.1.3 MECHANISM ASSEMBLY <M4>



Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P or KYODO-SH-JB	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in **AA** and **BB** indicate lubrication and greasing areas.

5.2 PARTS LIST

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
**********				
			PACKING AND ACCESSORY ASSEMBLY <M1>	
		301	LP31089-032B	PACKING CASE
		302	LP31091-001C	CUSHION ASSY
		303	LP41038-001A	POLY BAG
		306	LP21138-001C	REMOTE CONTROLLER
		306A	LP40991-001B	COVER(BATTERY)
	⚠	309	QAB0057-001	LI BATTERY
	⚠	310	LPT0730-001A	INST. BOOK(ENGLISH)
		312	PEAC0294-04	RF CABLE
		316	BT-51028-2	REGIST.CARD
		320	LPT0730-003A	SHEET(SETTING)
**********				
			FINAL ASSEMBLY <M2>	
	⚠	501	LP10464-001C	FRONT PANEL ASSY
		501A	LP21080-008A	CASSETTE DOOR
		501B	PQ46448	TORSION SPRING
		501C	LP31161-001A	WINDOW
		501D	LP10448-001B	COVER
		501E	PQ43013-7	FOOT,X2
	⚠	502	LP10418-001C	TOP COVER
		503	QYTDSF3010M	SCREW,X3 TOP COVER
		505	PDV2542A	DRUM ASSY
		510	QYSPSPD3008Z	SCREW,X3 DRUM
	⚠	511	LP10417-001C	BOTTOM CHASSIS
		515	QYTDSF4012Z	SCREW,X2 BOTTOM-MECHA
		516	QYSPSF3010Z	SCREW,X2 BOTTOM-C.HOUSING
		527	LP21101-001A	DRUM SHIELD
		528	QYSPST2606Z	SCREW,DRUM SHIELD
**********				
			MECHANISM ASSEMBLY <M4>	
		1	LP21039-001S	MAIN DECK ASSY
		3	LP40097-002D	GUIDE POLE CAP
		4	QAH0082-001	FULL ERASE HEAD
		15	LP30958-001B	LOAD.GEAR BASE
		16	QYTPST2620Z	SCREW,X2
		18	LP40798-001A	LORD. GEAR(SUPPLY) ASSY
		18A	LP21040-001A	LORD. GEAR(SUPPLY)
		18B	LP40799-001A	LORD. ARM(SUPPLY) ASSY
		19	LP40837-001A	TORSION SPRING(SUPPLY)
		20	LP40903-001A	FIXING PLATE
		21	LP40806-001D	POLE BASE ASSY(SUPPLY)
		22	LP30959-002A	LOAD GEAR
		23	LP40802-001C	LORD. GEAR(TAKE UP) ASSY
		23A	LP21041-001C	LORD. GEAR(TAKE UP)
		23B	LP40803-001A	LORD. ARM(TAKE UP) ASSY
		24	LP40838-001A	TORSION SPRING(TAKE UP)
		36	LP21055-001E	TU LEVER
		37	LP40943-001A	TENSION SPRING
		38	LP40859-001D	T-UP HEAD
		39	LP30961-001C	LID GUIDE
		42	LP40810-001A	PINCH ROLLER ARM ASSY
		44	LP40840-001D	TORSION SPRING
		46	LP30963-001B	PRESS LEVER
		47	PQM30017-24	SLIT WASHER
		48	LP40930-002E	S-SWITCH
		49	LP40813-001D	GIDE ARM ASSY
		50	LP40841-001A	TORSION SPRING
		52	QAH0081-001	AC HEAD
		53	LP30965-001A	HEAD BASE
		55	LP40842-001D	COMPRESSION SPRING
		57	LP41036-001A	A/C HEAD ADJ. SCREW,X3
		58	QYTDST2606Z	SCREW,X2 A/C HEAD-MAIN
		59	QAR0023-001	LOADING MOTOR
		60	QYTPSP3003Z	SCREW,X2 LOADING MOTOR
		61	LP21056-002G	MOTOR BRACKET
		62	QYTPST2620Z	SCREW
		63	LP40814-001B	WORM BEARING
		64	LP21044-001D	CONTROL CAM
		65	PQM30017-24	SLIT WASHER
		66	LP40815-001A	WORM GEAR
		67	LP40816-001B	HELICAL GEAR
		68	LP40817-001A	CONNECT GEAR
		69	LP10400-001J	CONTROL PLATE
		70	LP40843-001A	TORSION SPRING
		71	LP40818-001B	TENSION ARM ASSY
		72	LP40844-001E	TENSION SPRING
		73	LP21045-001D	TENSION ARM BASE
		74	LP40821-001A	TENSION BAND ASSY
		75	LP30967-001B	BAND HOLDER-1
		76	LP30968-001C	BAND HOLDER-2
		77	LP40822-002B	ADJUST PIN
		78	LP31000-005E	TENSION ARM LEVER
		79	LP21046-001C	MAIN BRAKE(TAKE UP)
		80	LP40824-001A	BAND BRAKE ASSY
		81	LP30969-002B	BRAKE LEVER
		82	LP30003-033B	TENSION SPRING
		83	LP30003-035B	TENSION SPRING
		84	LP40825-001B	CAPSTAN BRAKE ASSY
	⚠	85	QAR0204-002	CAPSTAN MOTOR
		86	QYTPSG2606Z	SCREW,X3 CAPSTAN MOTOR
		87	LP30005-010A	BELT,CAPSTAN MOTOR
		88	LP30970-001A	IDLER ARM
		89	LP40828-004A	IDLER GEAR 1,X2
		90	LP40829-002A	IDLER GEAR 2,X2
		91	LP31014-001A	WIRE HOLDER
		93	LP40934-001B	CLUTCH UNIT
		94	PQM30017-47	SLIT WASHER
		95	LP30973-001A	DIRECT GEAR
		96	LP40939-001A	COMPRESS. SPRING
		102	LP30974-001B	CHANGE LEVER
		105	LP21049-001A	REEL DISK,X2
		107	LP30017-004A	SPACER,X2
		110	LP10401-001H	SIDE FRAME(L)
		111	LP10402-001K	SIDE FRAME(R)
		112	QYTDST2606Z	SCREW,X2
		113	LP40917-001D	TORSION SPRING
		114	LP30976-001E	SIDE PLATE
		115	LP30977-002D	LIMIT PLATE
		116	LP40846-001C	LIMIT SPRING
		117	LP31100-001B	DRIVE LEVER
		118	LP30978-001B	DRIVE ARM(L)
		119	LP30979-001N	DRIVE ARM(R)
		120	LP40847-001B	TORSION SPRING
		121	LP30980-001E	CONNECT PLATE
		122	LP10403-001C	SIDE HOLDER(L)
		123	LP10404-001E	SIDE HOLDER(R)
		124	LP30983-001B	LOCK LEVER(L)
		125	LP30984-001B	LOCK LEVER(R)
		126	LP40924-001D	TENSION SPRING,X2
		127	LP40972-001A	EARTH SPRING(1)
		128	LP40857-001B	EARTH SPRING(2)
		130	LP30981-001G	CASETTE HOLDER ASSY
		134	LP21051-002C	REC SAFETY LEVER
		137	LP21052-001J	TOP FRAME
		151	LP30985-001G	DOOR OPENER
		161	LP40993-001A	TAPE GUIDE
		WR1	WJT0059-001E	E-CARD WIRE,DRUM
		WR2	WJT0067-001B	E-CARD WIRE,A/C HEAD CN2001
		WR3	WJS0022-001A	E-FL/RB WIRE,LOADING MOTOR

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

MAIN BOARD ASSEMBLY <03>

		PW1	LPA10187-01C1	MAIN BOARD ASSY
		IC1	JCP8060-NSA	IC
		IC1	or JCP8060-MSA	IC
		IC501	JCP8058	IC
			or JCP8058-2	IC
		IC1201	JCP8057	IC
		IC1201	or JCP8036	IC
	⚠	IC2201	AN3663FBP	IC
		IC3001	MN101D06GJL	IC
		IC3001	or MN101DF06KAFJL	IC
		IC3004	*(REFER TO BELOW)	IC(EEPROM)
		IC7002	GP1UM291QK	IR DETECT UNIT
		Q1	DTC144WU	DIGI TRANSISTOR
		Q1	or PDTC144WU	DIGI TRANSISTOR
		Q1	or RN1309	DIGI TRANSISTOR
		Q1	or UN521E	DIGI TRANSISTOR
		Q901	2SA1576A/QR/-X	TRANSISTOR
		Q901	or 2PA1576/R/-X	TRANSISTOR
		Q902	2SA1576A/QR/-X	TRANSISTOR
		Q902	or 2PA1576/R/-X	TRANSISTOR
		Q903	2SA1576A/QR/-X	TRANSISTOR
		Q903	or 2PA1576/R/-X	TRANSISTOR
		Q1201	2SC1317/RS/-T	TRANSISTOR
		Q1205	2SC4081/S/-X	TRANSISTOR
		Q1205	or 2PC4081/R/-X	TRANSISTOR
		Q1207	2SA1576A/QR/-X	TRANSISTOR
		Q1207	or 2PA1576/R/-X	TRANSISTOR
		Q2001	2SC4081/QRS/-X	TRANSISTOR
		Q2001	or 2PC4081/R/-X	TRANSISTOR
		Q2001	or 2SD1819A/QRS/-X	TRANSISTOR
		Q2002	2SC4081/QRS/-X	TRANSISTOR
		Q2002	or 2PC4081/R/-X	TRANSISTOR
		Q2002	or 2SD1819A/QRS/-X	TRANSISTOR
		Q2003	DTA144WU	DIGI TRANSISTOR
		Q2003	or PDTA144WU	DIGI TRANSISTOR
		Q2003	or RN2309	TRANSISTOR
		Q2003	or UN511E	DIGI TRANSISTOR
		Q2051	2SC4081/QRS/-X	TRANSISTOR
		Q2051	or 2SD1819A/QRS/-X	TRANSISTOR
		Q2051	or 2PC4081/R/-X	TRANSISTOR
		Q2052	2SA1576A/QR/-X	TRANSISTOR
		Q2052	or 2PA1576/R/-X	TRANSISTOR
		Q2052	or 2SB1218A/QR/-X	TRANSISTOR
		Q2053	DTC144WU	DIGI TRANSISTOR
		Q2053	or PDTC144WU	DIGI TRANSISTOR
		Q2053	or RN1309	DIGI TRANSISTOR
		Q2053	or UN521E	DIGI TRANSISTOR
		Q2054	2SA1576A/QR/-X	TRANSISTOR
		Q2054	or 2SB1218A/QR/-X	TRANSISTOR
		Q2054	or 2PA1576/R/-X	TRANSISTOR
		Q2055	DTC144WU	DIGI TRANSISTOR
		Q2055	or PDTC144WU	DIGI TRANSISTOR
		Q2055	or RN1309	DIGI TRANSISTOR
		Q2055	or UN521E	DIGI TRANSISTOR
		Q2201	DTA144WU	DIGI TRANSISTOR
		Q2201	or PDTA144WU	DIGI TRANSISTOR
		Q2201	or RN2309	TRANSISTOR
		Q2201	or UN511E	DIGI TRANSISTOR
		Q2202	DTC144WU	DIGI TRANSISTOR
		Q2202	or PDTC144WU	DIGI TRANSISTOR
		Q2202	or RN1309	DIGI TRANSISTOR
		Q2202	or UN521E	DIGI TRANSISTOR
		Q2203	2SC4081/QRS/-X	TRANSISTOR
		Q2203	or 2SD1819A/QRS/-X	TRANSISTOR
		Q2203	or 2PC4081/R/-X	TRANSISTOR
		Q2204	2SC4081/QRS/-X	TRANSISTOR
		Q2204	or 2PC4081/R/-X	TRANSISTOR
		Q2204	or 2SD1819A/QRS/-X	TRANSISTOR
		Q2251	DTC144WU	DIGI TRANSISTOR
		Q2251	or PDTC144WU	DIGI TRANSISTOR
		Q2251	or RN1309	DIGI TRANSISTOR
		Q2251	or UN521E	DIGI TRANSISTOR
		Q2252	DTC144WU	DIGI TRANSISTOR
		Q2252	or PDTC144WU	DIGI TRANSISTOR
		Q2252	or RN1309	DIGI TRANSISTOR
		Q2252	or UN521E	DIGI TRANSISTOR
		Q2253	DTC144WU	DIGI TRANSISTOR
		Q2253	or PDTC144WU	DIGI TRANSISTOR
		Q2253	or RN1309	DIGI TRANSISTOR
		Q2253	or UN521E	DIGI TRANSISTOR
		Q2254	DTC114EU	DIGI TRANSISTOR
		Q2254	or PDTC114EU	DIGI TRANSISTOR
		Q2254	or RN1302	DIGI TRANSISTOR
		Q2254	or UN5211	DIGI TRANSISTOR
		Q3002	PTZ-NV16A	IC(PHOTO SENSOR)
		Q3006	2SC4081/QRS/-X	TRANSISTOR
		Q3006	or 2SC4081/R/-X	TRANSISTOR
		Q3007	2SC4081/QRS/-X	TRANSISTOR
		Q3007	or 2SC4081/R/-X	TRANSISTOR
		Q4001	UN5211	DIGI TRANSISTOR
		Q4001	or RN1302	DIGI TRANSISTOR
		Q4001	or DTC114EU	DIGI TRANSISTOR
		Q4001	or PDTC114EU	DIGI TRANSISTOR
		Q4002	2SD1819A/QRS/-X	TRANSISTOR
		Q4002	or 2PC4081/R/-X	TRANSISTOR
		Q4002	or 2SC4081/QRS/-X	TRANSISTOR
	⚠	Q5101	2SK2043-CB14	FE TRANSISTOR
	⚠	Q5101	or 2SK2043	FE TRANSISTOR
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q5301	2SC1740S/RS/-T	TRANSISTOR
		Q5301	or 2SC3199/YG/-T	TRANSISTOR
		Q5303	2SC5739/QP/	TRANSISTOR
		Q5304	2SD2144S/UV/-T	TRANSISTOR
		Q5305	DTA114EU	DIGI TRANSISTOR
		Q5305	or PDTA114EU	DIGI TRANSISTOR
		Q5305	or RN2302	TRANSISTOR
		Q5305	or UN5111	DIGI TRANSISTOR
		Q5306	DTC114EU	DIGI TRANSISTOR
		Q5306	or PDTC114EU	DIGI TRANSISTOR
		Q5306	or RN1302	DIGI TRANSISTOR
		Q5306	or UN5211	DIGI TRANSISTOR
		Q6030	2SB1218A/QR/-X	TRANSISTOR
		Q6030	or 2SA1576A/QR/-X	TRANSISTOR
		Q6030	or 2PA1576/R/-X	TRANSISTOR
		Q7001	DTA143TU	DIGI TRANSISTOR
		Q7002	DTA143TU	DIGI TRANSISTOR
		Q7003	DTA143TU	DIGI TRANSISTOR
		Q7004	DTA143TU	DIGI TRANSISTOR

* HR-S2902US : LPN0773-001A-03

The VCR goes to jig RCU mode after replacing the EEPROM and the VCR does not accept some RCU command.
Therefore please set the VCR to the user RCU mode after replacing the EEPROM.
The method of setting the VCR to the user RCU mode is written on the service manual.

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		Q7005	DTA143TU	DIGI TRANSISTOR
		Q7008	DTC143TU	DIGI TRANSISTOR
		Q7008	or UN5216	TRANSISTOR
		Q7009	DTC143TU	DIGI TRANSISTOR
		Q7009	or UN5216	TRANSISTOR
		Q7010	DTC143TU	DIGI TRANSISTOR
		Q7010	or UN5216	TRANSISTOR
		Q7011	DTC143TU	DIGI TRANSISTOR
		Q7011	or UN5216	TRANSISTOR
		Q7012	DTC143TU	DIGI TRANSISTOR
		Q7012	or UN5216	TRANSISTOR
		Q7013	DTC143TU	DIGI TRANSISTOR
		Q7013	or UN5216	TRANSISTOR
		Q7014	DTC143TU	DIGI TRANSISTOR
		Q7014	or UN5216	TRANSISTOR
		D1	QUY153-050Y	IM BUS WIRE
		D1201	RD3.9ES/B2/-T2	ZENER DIODE
		D1201	or MTZJ3.9B	ZENER DIODE
		D2001	1SS133	DIODE
		D2001	or 1SS270A	DIODE
		D2251	1SS133	DIODE
		D2251	or 1SS270A	DIODE
		D3001	LNB2301L01VI	LE DIODE
		D3002	1SS133	DIODE
		D3002	or 1SS270A	DIODE
		D3005	11ES2	DIODE
		D3005	or 1A3G	DIODE
		D3016	MTZJ3.9B	ZENER DIODE
		D3016	or RD3.9ES/B2/-T2	ZENER DIODE
		D5001	S1WB/A/60-4102	BRIDGE DIODE
		D5001	or S1WB(A)60F4072X	BRIDGE DIODE
		D5001	or S1WB/A/60-X	BRIDGE DIODE
		D5101	AU01	DIODE
		D5101	or 10ELS4	FR DIODE
		D5102	AU01	DIODE
		D5102	or 10ELS4	FR DIODE
		D5103	1SS133	DIODE
		D5103	or 1SS270A	DIODE
		D5105	1SS133	DIODE
		D5105	or 1SS270A	DIODE
		D5203	AU01Z	FR DIODE
		D5203	or 10ELS2	FR DIODE
		D5204	AU01Z	FR DIODE
		D5204	or 10ELS2	FR DIODE
		D5206	AW04	SB DIODE
		D5206	or AK04	SB DIODE
		D5206	or SBO40	SB DIODE
		D5206	or 11EQS04	SB DIODE
		D5206	or 1S4	SB DIODE
		D5207	AW04	SB DIODE
		D5207	or SBO40	SB DIODE
		D5207	or 1S4	SB DIODE
		D5207	or AK04	SB DIODE
		D5207	or 11EQS04	SB DIODE
		D5210	AU01Z	FR DIODE
		D5210	or PG104RS	FR DIODE
		D5210	or 1SR153-400-T2	FR DIODE
		D5210	or ERA18-02-T2	FR DIODE
		D5210	or 10ELS2	FR DIODE
		D5301	MTZJ15C	ZENER DIODE
		D5301	or RD15ES/B3/-T2	ZENER DIODE

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		D5302	MTZJ12A	ZENER DIODE	
		D5302	or RD12ES/B1/-T2	ZENER DIODE	
		D5303	MTZJ5.6A	ZENER DIODE	
		D5303	or RD5.6ES/B1/-T2	ZENER DIODE	
		D5305	MTZJ5.6C	ZENER DIODE	
		D5305	or RD5.6ES/B3/-T2	ZENER DIODE	
		D6002	HZ30-2L-T2	ZENER DIODE	
		D6002	or HZ30-2LTD	Z DIODE (M)	
		R1	NRSA02J-622X	MG RESISTOR	6.2kΩ,1/10W
		R2	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R4	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R11	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R12	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R14	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R19	NCB21HK-103X	CAPACITOR	0.01μF,50V
		R27	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R36	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R37	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R201	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R202	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R501	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R503	NRVA02D-152X	CMF RESISTOR	1.5kΩ,1/10W
		R504	NRVA02D-561X	CMF RESISTOR	560Ω,1/10W
		R505	NRVA02D-102X	CMF RESISTOR	1kΩ,1/10W
		R506	NRVA02D-392X	CMF RESISTOR	3.9kΩ,1/10W
		R507	NRVA02D-392X	CMF RESISTOR	3.9kΩ,1/10W
		R508	NRVA02D-102X	CMF RESISTOR	1kΩ,1/10W
		R510	NRSA02J-475X	MG RESISTOR	4.7MΩ,1/10W
		R903	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R904	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R905	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R912	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R913	NRSA02J-680X	MG RESISTOR	68Ω,1/10W
		R915	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R917	QRE123J-331X	RESISTOR	330Ω,1/2W
		R918	QRE123J-331X	RESISTOR	330Ω,1/2W
		R919	QRE123J-331X	RESISTOR	330Ω,1/2W
		R920	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R921	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R1201	NRSA02J-121X	MG RESISTOR	120Ω,1/10W
		R1202	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R1203	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R1204	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R1205	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R1206	QRE141J-561Y	RESISTOR	560Ω,1/4W
		R1207	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R1208	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R1209	NRSA02J-180X	MG RESISTOR	18Ω,1/10W
		R1210	NRVA02D-393X	CMF RESISTOR	39kΩ,1/10W
		R1211	NRVA02D-183X	CMF RESISTOR	18kΩ,1/10W
		R1214	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R1217	NRVA02D-680X	CMF RESISTOR	68Ω,1/10W
		R1218	NRVA02D-301X	CMF RESISTOR	300Ω,1/10W
		R1220	QRE141J-561Y	RESISTOR	560Ω,1/4W
		R1223	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R1224	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R1229	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R1230	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R1231	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R2003	NRSA02J-101X	MG RESISTOR	100Ω,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R2007	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2010	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2013	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2014	NRSA02J-394X	MG RESISTOR	390kΩ,1/10W
		R2015	NRSA02J-391X	MG RESISTOR	390Ω,1/10W
		R2016	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2017	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2021	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R2022	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2023	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2024	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2053	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	QRE141J-820Y	RESISTOR	82Ω,1/4W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2201	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2202	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2205	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2206	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2209	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2210	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2211	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2212	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2213	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2214	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2215	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2216	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2217	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2218	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R2219	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2220	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2230	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2231	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2251	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2252	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2253	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2254	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2255	QRE141J-273Y	RESISTOR	27kΩ,1/4W
		R2256	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R2257	NRSA02J-684X	MG RESISTOR	680kΩ,1/10W
		R2258	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3005	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3006	QUY160-100Y	IM BUS WIRE	
		R3007	QUY160-100Y	IM BUS WIRE	
		R3008	QUY160-100Y	IM BUS WIRE	
		R3009	QUY160-100Y	IM BUS WIRE	
		R3010	QUY160-100Y	IM BUS WIRE	
		R3011	QUY160-100Y	IM BUS WIRE	
		R3012	QUY160-100Y	IM BUS WIRE	
		R3015	QUY153-050Y	IM BUS WIRE	
		R3017	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3018	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3021	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3022	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3031	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3032	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3035	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3043	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3064	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3066	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3086	QUY160-100Y	IM BUS WIRE	
		R3087	QUY160-100Y	IM BUS WIRE	
		R3088	QUY160-100Y	IM BUS WIRE	
		R3089	QUY160-100Y	IM BUS WIRE	
		R3091	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3092	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3093	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3094	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3095	QUY160-100Y	IM BUS WIRE	
		R3096	QUY160-100Y	IM BUS WIRE	
		R3097	QUY160-100Y	IM BUS WIRE	
		R3098	QUY160-100Y	IM BUS WIRE	
		R3099	QUY160-100Y	IM BUS WIRE	
		R3205	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3206	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3207	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3208	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3209	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3211	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3212	NRSA02J-121X	MG RESISTOR	120Ω,1/10W
		R3213	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3214	NRSA02J-121X	MG RESISTOR	120Ω,1/10W
		R3215	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3216	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
		R3217	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
		R3218	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3219	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3220	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R3222	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3223	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3224	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3226	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3227	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3237	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3238	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3242	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3243	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R3244	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R3245	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R3252	QRE141J-153Y	RESISTOR	15kΩ,1/4W
		R3253	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4001	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4002	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R4003	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4010	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4011	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4012	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4019	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	⚠	R5001	QRZ9046-475Z	RESISTOR	4.7MΩ,1/2W
		R5101	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5102	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG029J-154G	OMF RESISTOR	150kΩ,2W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
		R5108	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R5109	QRE141J-681Y	RESISTOR	680Ω,1/4W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5112	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R5304	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5306	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R5310	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R5312	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5313	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
		R6020	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6021	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6030	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R6031	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6050	QRE141J-330Y	RESISTOR	33Ω,1/4W
		R6051	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R6056	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6502	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R7002	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7003	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7004	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7005	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7006	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7007	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7008	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		VR2251	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		B1	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B3	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B4	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B6	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B501	QUY160-160Y	IM BUS WIRE	
		B503	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B903	QUY160-060Y	IM BUS WIRE	
		B906	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B1201	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B1202	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B1203	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B2051	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B3001	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B5302	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B6020	QUY160-220Y	IM BUS WIRE	
		B6531	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B7001	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C1	NDC21HJ-151X	CAPACITOR	150pF,50V
		C2	NDC21HJ-4R0X	CAPACITOR	4pF,50V
		C3	NDC21HJ-470X	CAPACITOR	47pF,50V
		C4	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C5	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C8	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C9	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C10	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C11	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C13	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C14	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C15	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C16	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C18	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C19	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C20	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C21	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C23	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C24	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C25	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C26	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C27	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C30	NCB21HK-331X	CAPACITOR	330pF,50V
		C31	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C32	QCBB1HK-104	CAPACITOR	0.1μF,50V
		C33	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C34	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C35	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C36	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C37	NDC21HJ-4R0X	CAPACITOR	4pF,50V
		C38	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C39	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C40	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C41	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C43	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C44	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C45	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C46	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C47	QEKJ1HM-474	E CAPACITOR	0.47μF,50V
		C48	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C49	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C50	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C52	NDC21HJ-150X	CAPACITOR	15pF,50V
		C56	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C57	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C58	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C59	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C60	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C61	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C62	QCBB1HK-103	CAPACITOR	0.01μF,50V
		C63	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C64	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C201	QERF0JM-476	E CAPACITOR	47μF,6.3V
		C203	NCF21CZ-105X	CAPACITOR	1μF,16V
		C205	NDC21HJ-101X	CAPACITOR	100pF,50V
		C207	NCF21CZ-105X	CAPACITOR	1μF,16V
		C501	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C502	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C503	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C504	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C507	QCBB1HK-103	CAPACITOR	0.01μF,50V
		C508	NCB21HK-104X	CAPACITOR	0.1μF,50V
		C509	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C510	QCBB1HK-103	CAPACITOR	0.01μF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C511	QEKJ0JM-337	E CAPACITOR	330μF,6.3V
		C513	NDC21HJ-221X	CAPACITOR	220pF,50V
		C514	NDC21HG-271X	CAPACITOR	270pF,50V
		C515	NDC21HJ-121X	CAPACITOR	120pF,50V
		C516	NDC21HG-271X	CAPACITOR	270pF,50V
		C517	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C518	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C519	NDC21HG-271X	CAPACITOR	270pF,50V
		C520	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C521	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C522	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C523	QCBB1HK-103	CAPACITOR	0.01μF,50V
		C524	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C525	QCBB1HK-103	CAPACITOR	0.01μF,50V
		C528	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C529	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C530	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C537	NDC21HJ-5R0X	CAPACITOR	5pF,50V
		C539	QCBB1HK-103	CAPACITOR	0.01μF,50V
		C922	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C923	QETN0JM-477	E CAPACITOR	470μF,6.3V
		C924	QETN0JM-477	E CAPACITOR	470μF,6.3V
		C926	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C1201	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1204	NDC21HJ-101X	CAPACITOR	100pF,50V
		C1211	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1212	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C1213	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1214	NCF21CZ-105X	CAPACITOR	1μF,16V
		C1215	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1216	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1217	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1218	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1219	NCF21CZ-105X	CAPACITOR	1μF,16V
		C1220	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1227	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C1228	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C1229	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C1230	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1231	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1232	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1233	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C1234	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1235	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1236	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1237	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C1243	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C1244	QEKC1EM-475	E CAPACITOR	4.7μF,25V
		C1246	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C1249	NDC21HJ-470X	CAPACITOR	47pF,50V
		C2001	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2002	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C2003	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2004	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2005	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2006	NCB21HK-682X	CAPACITOR	0.0068μF,50V
		C2007	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2008	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2009	NCB21HK-152X	CAPACITOR	0.0015μF,50V
		C2010	NCB21HK-821X	CAPACITOR	820pF,50V
		C2011	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2012	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C2054	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C2055	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2065	QFN31HJ-823	F CAPACITOR	0.082μF,50V
		C2201	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2202	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2203	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C2204	QEKJ0JM-336	E CAPACITOR	33μF,6.3V
		C2205	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2206	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2207	NCB21HK-153X	CAPACITOR	0.015μF,50V
		C2208	NCB21HK-153X	CAPACITOR	0.015μF,50V
		C2209	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2210	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2211	QEKJ0JM-336	E CAPACITOR	33μF,6.3V
		C2212	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2214	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2215	QEKC1EM-106	E CAPACITOR	10μF,25V
		C2216	QEKC1CM-476	E CAPACITOR	47μF,16V
		C2218	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2219	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2220	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C2221	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C2222	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2230	NDC21HJ-101X	CAPACITOR	100pF,50V
		C2231	NDC21HJ-101X	CAPACITOR	100pF,50V
		C2251	QDYB1CN-103Y	CAPACITOR	0.01μF,16V
		C2252	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2253	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2254	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2255	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2256	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2257	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2259	QEKJ1HM-334	E CAPACITOR	0.33μF,50V
		C3011	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C3016	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3017	NDC21HJ-220X	CAPACITOR	22pF,50V
		C3023	NCF21CZ-105X	CAPACITOR	1μF,16V
		C3035	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C3036	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C3041	QCBB1HJ-101	CAPACITOR	100pF,50V
		C3042	QCBB1HJ-101	CAPACITOR	100pF,50V
		C3051	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C3052	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3071	QETJ1HM-336	E CAPACITOR	33μF,50V
		C4001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C4002	QERF1HM-105	E CAPACITOR	1μF,50V
		C4004	QERF1AM-336	E CAPACITOR	33μF,10V
		C4006	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C4007	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C4009	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4010	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C4011	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4019	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C4031	QETF1CM-336	E CAPACITOR	33μF,16V
	⚠	C5001	QFZ9072-683	F CAPACITOR	0.068μF,250V
	⚠	C5004	QCZ9094-472	CAPACITOR	0.0047μF,125V
		C5006	QETM2DM-826	E CAPACITOR	82μF,200V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0339-151Z	CAPACITOR	150pF
		C5104	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
		C5107	QFVF1HJ-104Z	F CAPACITOR	0.1μF,50V
		C5202	QETN1CM-108	E CAPACITOR	1000μF,16V
		C5203	QEMT1AM-128	E CAPACITOR	1200μF,10V
		C5204	QETJ2AM-475	E CAPACITOR	4.7μF,100V
		C5206	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C5207	QEKJ1CM-107	E CAPACITOR	100μF,16V
		C5301	QEKJ1CM-107	E CAPACITOR	100μF,16V
		C5303	QEKJ1CM-107	E CAPACITOR	100μF,16V
		C5305	QFVF1HJ-104Z	F CAPACITOR	0.1μF,50V
		C6052	NDC21HJ-100X	CAPACITOR	10pF,50V
		C6056	NDC21HJ-470X	CAPACITOR	47pF,50V
		C6501	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6502	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C6503	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6504	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C6505	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C6508	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C6509	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6511	QDYB1CM-103Y	CAPACITOR	0.01μF,16V
		C6512	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C6513	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C6514	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C6515	QEKC1HM-335	E CAPACITOR	3.3μF,50V
		C6516	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C6517	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C6532	NCB21HK-104X	CAPACITOR	0.1μF,50V
		C6533	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C7011	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		L1	QQL231J-151Y	COIL	150μH
		L2	QUY153-050Y	IM BUS WIRE	
		L3	QQL29BJ-100Z	COIL	10μH
		L5	QQL29BJ-100Z	COIL	10μH
	⚠	L6	QQL29BJ-100Z	COIL	10μH
		L7	QQL01BJ-120Z	COIL	12μH
		L9	QQL231J-100Y	COIL	10μH
	⚠	L10	QQL29BJ-100Z	COIL	10μH
		L201	QUY153-050Y	IM BUS WIRE	
		L203	QQL231J-1R0Y	COIL	1.0μH
		L501	QQL29BJ-101Z	COIL	100μH
		L502	QQL29BJ-100Z	COIL	10μH
		L504	QUY153-050Y	IM BUS WIRE	
		L901	QQL29BJ-101Z	COIL	100μH
		L1202	QQL29BJ-331Z	COIL	330μH
		L1203	QQL29BJ-101Z	COIL	100μH
		L1204	QQL29BJ-101Z	COIL	100μH
		L1205	QUY153-050Y	IM BUS WIRE	
		L1206	QUY153-050Y	IM BUS WIRE	
		L1207	QQL29BJ-101Z	COIL	100μH
		L1208	QUY153-050Y	IM BUS WIRE	
		L2001	QUY153-050Y	IM BUS WIRE	
		L2201	QUY153-050Y	IM BUS WIRE	
		L2251	QQL29BJ-100Z	COIL	10μH
		L4001	QUY153-050Y	IM BUS WIRE	
		L5201	PELN1184	COIL	33μH
		L5202	PELN1184	COIL	33μH
		L5301	QUY153-050Y	IM BUS WIRE	
		L6001	QQL29BK-1R0Z	COIL	1.0μH
		L6003	QQL29BK-1R0Z	COIL	1.0μH
		L6004	QUY153-050Y	IM BUS WIRE	
		L6032	QUY153-050Y	IM BUS WIRE	
		L6050	QQL29BK-1R0Z	COIL	1.0μH
		L6501	QUY153-050Y	IM BUS WIRE	
		LC1201	QQL29BJ-101Z	COIL	1.0μH
		X2	QAX0739-001	CRYSTAL RESONATOR	
		X3001	QAX0526-001	CRYSTAL RESONATOR	
		S3001	QSW0602-004	PUSH SWITCH,REC SAFETY	
		S3002	QSW0602-004	PUSH SWITCH,S CASS	
		S7002	QSW0456-002Z	TACT SWITCH,POWER	
		S7004	QSW0456-002Z	TACT SWITCH,REW/CH-	
		S7006	QSW0456-002Z	TACT SWITCH,FF/CH+	
		S7008	QSW0456-002Z	TACT SWITCH,REC	
		S7010	QSW0456-002Z	TACT SWITCH,PAUSE/CH	
		S7011	QSW0456-002Z	TACT SWITCH,PLAY	
		S7013	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		K5101	QQR0678-001Z	FERRATE BEADS	
		K5102	QQR0678-001Z	FERRATE BEADS	
		PC3001	RPI-304J	IC(PHOTO SENSOR)	
		PC3002	RPI-304J	IC(PHOTO SENSOR)	
	⚠	PC5101	PC817X	IC(PHOTO COUPLER)	
	⚠	PC5101 or	PS2501-1	IC(PHOTO COUPLER)	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0186-001	SW TRANSFORMER	
	⚠	TB1	LP21113-001A	TERMINAL BOARD	
		TU6001	QAU0255-002	TUNER	
		SD1	LP21126-001A	SHIELD CASE(PRE)	
		SD2	LP31098-001B	SHIELD CASE(DEG)	
		DI7001	LTG-Y2K12M-01J	LE DIODE	
	⚠	CD1	QMPD340-165-K	POWER CORD	
		JS3001	QSW0954-002	ROTARY ENCODER	
		J2	QNN0530-001	PIN JACK,REAR OUT	
		J7101	QNN0524-002	PIN JACK,FRONT AV IN	
		J7103	QND0106-001	S JACK,FRONT S IN	
		FC5001	QNG0006-001Z	FUSE CLIP	
		FC5002	QNG0006-001Z	FUSE CLIP	
	⚠	LF5002	QQR0532-001	LINE FILTER	
	⚠	VA5001	QAF0023-431Z	VARISTOR	
		TP106	QUY160-100Y	IM BUS WIRE,PB FM	
		TP111	QUY153-050Y	IM BUS WIRE,D FF	
		TP2253	QUY153-050Y	IM BUS WIRE,A.PB	
		TP2254	QUY153-050Y	IM BUS WIRE,A.REC	
		TP4001	QUY153-050Y	IM BUS WIRE,CTL.P	
		CN1	QGF1201C2-09	FPC CONNECTOR,(1-9)DRUM	
		CN2001	QGF1207C1-06	FPC CONNECTOR,(1-6)A/C HEAD	
		CN2002	QGB2532J1-02	B TO B CONNECTOR,(1-2)FE HEAD	
		CN3001	QGB2032M4-12	B TO B CONNECTOR,(1-12)CAPSTAN MOTOR	
		CP3001	QUY153-050Y	IM BUS WIRE	
		CP4001	QUY153-050Y	IM BUS WIRE	
	⚠	F5001	QMF51N2-1R25J1	FUSE	T1.25A,AC250V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
**********				
			A/C HEAD BOARD ASSEMBLY <12>	
		PW1	LPA10158-01A1	A/C HEAD BOARD ASSEMBLY
**********				
			LOADING MOTOR BOARD ASSEMBLY <55>	
		PW2	LPA10158-01A2	LOADING MOTOR BOARD ASSY